VOL. 11
NO. 8

AUGUST • 1943

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You're well acquainted with genial Tom Plouff if you're an Ansul customer in the territory he serves so well: North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa (excepting Davenport) and the western half of Missouri.

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CHEMICAL COMPANY

Agents for Kinetic's "FREON-12"

MARINETTE • WISCONSIN

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RS-37

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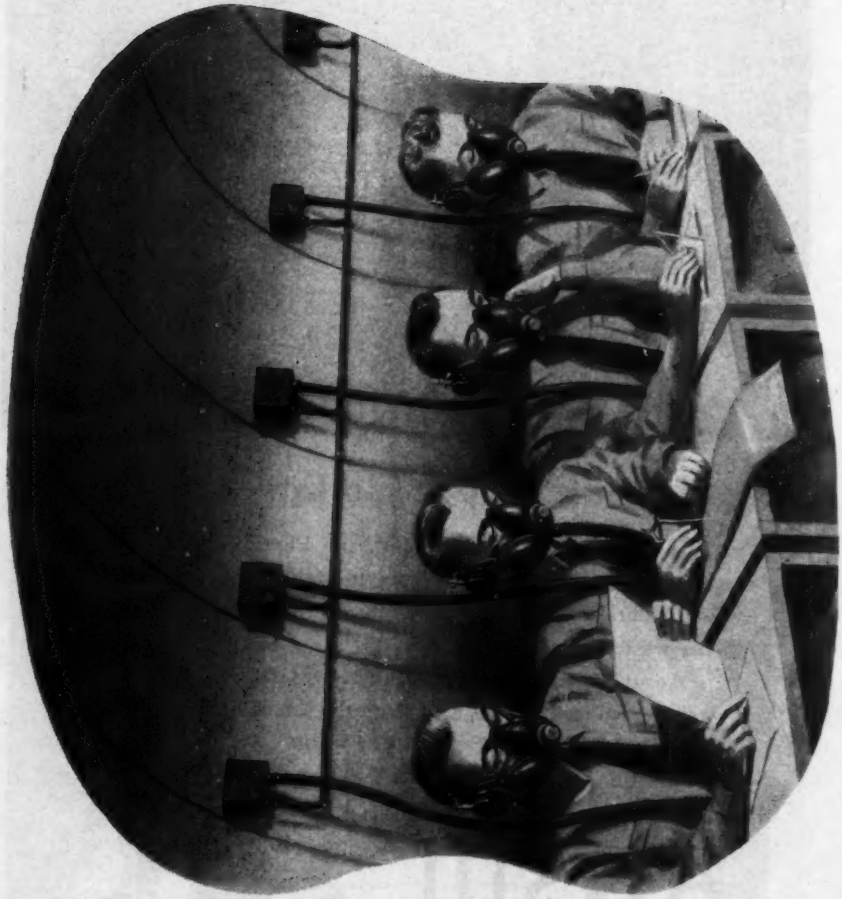

Miles Up . . . On The Ground

IN ORDER that high-flying bomber pilots, gunners and navigators may become accustomed to the rarefied atmosphere encountered at high altitudes, and that student pilots may be graded with regard to their resistance to lack of oxygen and susceptibility to "bends", a long and rigorous series of tests is undergone by all fliers in decompression test chambers, where conditions found at any given altitude may be duplicated.

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All over the world, in the air, on land and sea, wherever refrigeration is playing its important role, will be found "Detroit" refrigeration products—helping in many ways to win the war today—and contributing to the world's health and well being tomorrow.

•

"Detroit" Expansion Valves and Controls are doing their bit for Victory all over the world. Wherever there is need for refrigeration or air conditioning, there you will find Detroit products.

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There can be no compromise in precision control and dependability of valves supplying life-supporting oxygen to our fighting men. Kerotest Valves fully meet this great responsibility because they are designed and engineered to do a specific job *better.*

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The WAR ISN'T WON

. . . by a long shot!

To assume that a few limited gains against the enemy's weak spots means the end of the war, and to relax therefore in our War Effort, is a fatal mistake. Such an attitude is as dangerous as the guns of the Axis and the result is the worst kind of sabotage.

Authorities state that factors contributing to failure to meet June war production schedules were over-confidence, absenteeism, and apathy. This let-down may continue still further if we fall for the Axis propaganda that the war has been practically won.

Sure, our victories so far have been won by the blood and sweat of our men and those of our Allies, but take a look at a map of Hitler's Europe and Hirohito's ill-gotten empire and see how much farther we have to go.

This is no time to relax for an instant. There's hard fighting and hard work ahead for everyone — every day from now 'til Victory.

ALCO VALVE COMPANY — 857 Kingsland Avenue, St. Louis, Missouri

A vote of thanks is due to YOU!

IN spite of wartime restrictions—difficulties in getting repair parts—the impossibility of getting new commercial refrigeration equipment for non-war users—you service engineers have kept existing installations running. For your skill, your ingenuity and plain hard work in doing this vital job, a vote of thanks is due!

The present situation has its *good* points, too, for it offers you many new opportunities. Industrial applications of refrigeration are expanding daily. Keep your eyes open for opportunities to suggest new installations of G-E "Scotch Giants" in plants doing war work—and to get service contracts with war industries.

Under wartime conditions, the quality and dependability of G-E refrigeration equipment shows up clearly. When the war is over, refrigeration will continue to grow in importance in manufacturing—and *your* field is bound to grow with it.

General Electric Co., Air Conditioning and Commercial Refrigeration Divisions, Section 3718, Bloomfield, New Jersey.

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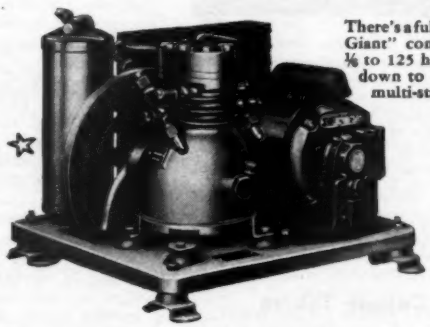


There's a full line of G-E "Scotch Giant" condensing units from ⅛ to 125 hp—for temperatures down to -130F, in single or multi-stage systems.

Listen to the General Electric radio programs: "THE HOUR OF CHARM", Sundays, 10 P.M., EWT, on NBC..."THE WORLD TODAY" News, Weekdays, 6:45 P.M., EWT, on CBS

GENERAL ELECTRIC

"Scotch Giant" Condensing Units

IMPERIAL *Data Sheets*

3. FLARING COPPER TUBING

This is the second of a series of Imperial data sheets published in the form of advertisements presented by Imperial as a small contribution toward the problem of handling service work under wartime conditions.

IN preparing the tubing for flaring, consideration must be given to the burr on the inside of the tubing caused by the tube cutter. The standard bar and yoke type flaring tools are furnished with either a swivel or a fixed cone. If the burr is removed when flaring with a swivel or fixed cone the result will be a smooth, single flare. If the burr is not removed when using a swivel cone the flaring of the tubing will have a tendency to produce a partial double flare

A flare block and yoke type screw feed flaring tool in operation

which is not recommended. When using a fixed cone if the burr is not removed the flare will have a slightly heavier reinforced edge caused by the additional metal of the burr. Some operators believe that this will help to make a tighter joint.

Tube cutters are usually provided with a reamer on the end which can be used for reaming out the burr.

Flaring Copper Tubing

In making flared joints in the tubing, there is one essential which must be remembered. A good, smooth, narrow flared joint is much better than a rough looking wide flared joint.

Although there are several types of tools for making flares, the most satisfactory flares are made with a flare block and a yoke type screw feed flaring tool.

In making a flare with this type of tool the tubing is placed in the flare block with the end of the tubing protruding slightly beyond the face of the block. The amount protruding will soon be ascertained by constant practice.

Care must be taken that the tubing is clamped absolutely tight in the block and that the flaring yoke will not force the tubing back out of the block and leave an uncompleted flare.

The threaded jaws and tightening the thumb screws on either end of the flare block will keep the tubing from slipping.

Before slipping the yoke over the bar to start flaring it is advisable to put a little oil on the cone or spreader so that there will no tendency of the cone to tear into the tubing by sticking to it. The thread in the yoke of the tool should also be oiled occasionally or it will wear out and finally strip.

Place the cone on the end of the tubing and turn it down until the flared part of the tube fits solidly against the counter sunk recess in the flare block.

The tubing is now flared and should be inspected to see that both surfaces of the flare have no splits or other imperfections.

There are some flaring tools having a cone which has several rollers in it and this tool makes a very fine flare by first forcing down the metal to the point where it is sufficient width to make a good joint. The tool can then be adjusted so that the cone does not go down deeper into the tubing to make the flare larger but instead the three rollers burnish the flare to a smooth shiny surface.

In this tool the flare is made in the air; that is, it is not backed up by the tool itself but merely flared out from the tubing. This produces a rounded corner on the underneath side of the flare which is very essential to a good joint because the tubing is not abruptly bent at this point.

Where a flared connection is used on units subjected to vibration a great deal of care must be taken in making up the flare. The more the tubing is worked the harder it becomes and vibration will usually break or crack the tubing at these hardened parts.

In making up flared joints, it is always well to be sure that the face of the flare and the seat of the fitting are clean and free from dirt. It is a good practice to put a little oil on the surfaces to be made up, as well as on the back surface of the flare, so that when the nut is drawn up it

IMPERIAL

STRAINERS • DEHYDRATORS • VALVES • FITTINGS • FLOATS • CHARGING LIN TOO

will have a good slippery surface to draw against because copper has a tendency to stick and may tear if drawn up too tight on a dry surface.

Double Flare for Steel Tubing

When flaring steel tubing with the conventional flaring tool the tubing will crack at the flare in many instances even though care has been taken in making the flare.

Should a flare be desired it is recommended that a double flare be made on the tubing and there are several tools which can be had for this purpose. Probably the most outstanding tool for making a double flare on tubing is a tool that consists of a flaring bar, yoke and adapter.

In making a double flare the steel tubing is clamped in the flare bar with the end of tubing protruding above top of flaring bar by a distance equal to the thickness of the shoulder on adapter of the corresponding size. (For ¼" use ¼" adapter.)

Place yoke over bar of tool. Now place adapter of the proper size on the protruding end of tubing with the pilot or stem of adapter inserted into tubing.

Move yoke so that the flaring cone centers directly over the adapter and turn flaring cone down until shoulder of adapter rests on flaring bar. This performs a belling operation on tubing, as shown in Fig. 1.

Now back flaring cone off slightly, removing adapter and then screw cone down again, this time directly onto the tubing. This folds the tubing back on itself, as shown in Fig. 2, forming an accurate 45° double flare without cracking or splitting the tubing.

Oiling the surfaces to be made up as in making single flares is recommended.

Flaring Plastic Tubing

Plastic tubing can be flared with a standard bar and yoke type flaring tool to make up a single flare joint. However, unless heat is applied to the flaring cone the flare will not remain at the required 45° angle but will spring back to an angle of about 25°. When working with small size tubing this spring-back is not serious as the flare will be forced back to a 45° angle when assembled to the flare fittings. This difference can be eliminated by the use of the new standard bar and yoke type flaring tool which produces a double flare of plastic tubing. This type of flare is strongly recommended for large tube sizes. The method of double flaring plastic tubing is the same as flaring steel tubing and the tool is very similar, the difference being in the size of the holes in the bar for holding the tubing and the construction of the adapters.

In flaring plastic tubing you must bear in mind that as the temperature drops the tubing becomes more brittle and as the temperature rises the tubing becomes softer.

When flaring tubing when the temperature is low it is advisable to either dip the tubing or the flaring tool in hot water before performing the operation.

These diagrams illustrate new, simple way to double flare steel tubing.

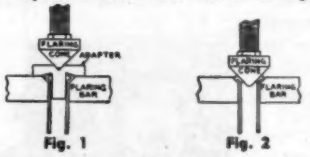


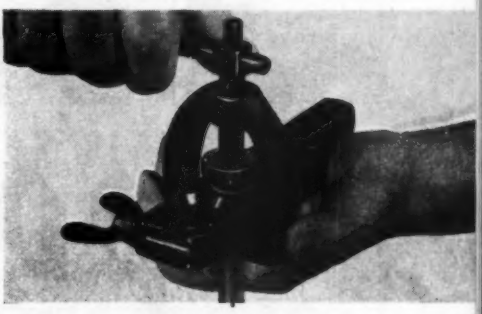
Fig. 1 — Fig. 2

At the left the flaring cone is screwed down with proper size adapter in place in the tubing. This bells tubing as shown above.

As shown at the right the cone is then backed off slightly, adapter removed and cone screwed down just as on a conventional flaring tool. The result is an accurate 45° double flare.

IMPERIAL *Data Sheets*

FLARING STEEL TUBING 4.



Flaring a piece of plastic tubing with a double flaring tool.

THE IMPERIAL BRASS MFG. CO., 1204 W. Harrison St., Chicago 7, Ill.

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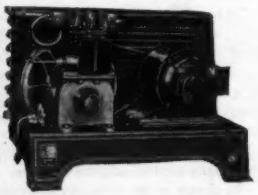
Synonymous with "proper refrigeration" is the name of "Brunner." For many years the Refrigeration Industry has come to regard Brunner condensing units and refrigeration equipment as thoroughly dependable in every respect. Today that enviable reputation is undergoing the test of its life... and coming through with flying colors!

Before the war, Brunner was tops. During this war Brunner still leads. And when the war is over, and for many years after that, you can pin your faith on Brunner... and never be let down!



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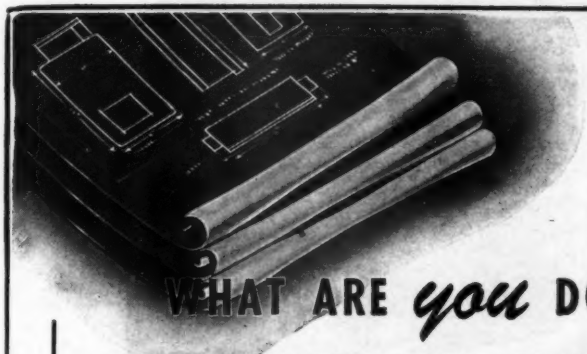

WHAT ARE *you* DOING ABOUT POST-WAR PLANNING?

Practical, well-laid post-war plans are the immediate need of all industry. Many important new developments, applied through intelligent planning, will bring new efficiency and comfort to a world at peace.

If dependable temperature or pressure control is a factor in the successful application of your product or service, it will pay you to investigate the White-Rodgers Hydraulic-Action principle and other new developments in temperature and pressure control.

Because of the importance of post-war plans to American industry we have prepared a "Post-War Planning Checklist" which may be of assistance in setting up your own post-war program. We shall be glad to send you a copy upon request.

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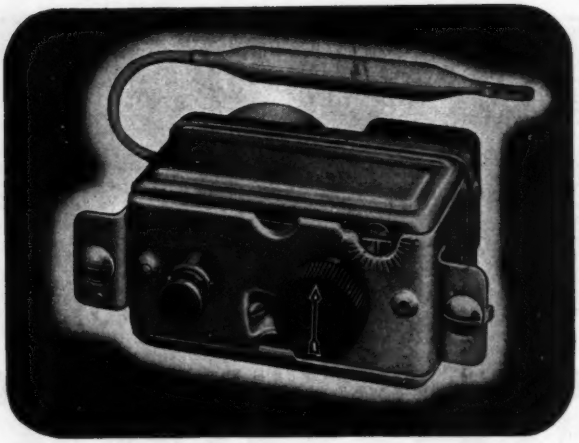

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Men and women in the army of workers at Ranco are also placed in the job for which they are best suited. That is why Ranco controls are so uniformly perfect in performance.

Ranco Inc.

COLUMBUS, OHIO

The Refrigeration Service Engineer

Vol. 11 No. 8

August, 1943

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems and Oil Burners

Official Organ
REFRIGERATION SERVICE ENGINEERS SOCIETY

The Cover

A student at the Camp Lee, Va., Quartermaster Replacement Training Center Refrigeration School inspects a new refrigerating unit for the portable pre-fabricated cold storage warehouse. Story in July issue.

Published by
Nickerson & Collins Co.
433-435 North Waller Ave.
Chicago, 44
Telephones Austin 1303-1304-1305

EASTERN OFFICE
420 Lexington Ave., New York City
Telephone Lexington 2-4816

Publishers of Technical Books and Trade Journals Serving the Refrigeration Industries for over 50 years.

Subscription Rates United States $2.00 per year. Single copies 25c. All other countries $3.00 per year.

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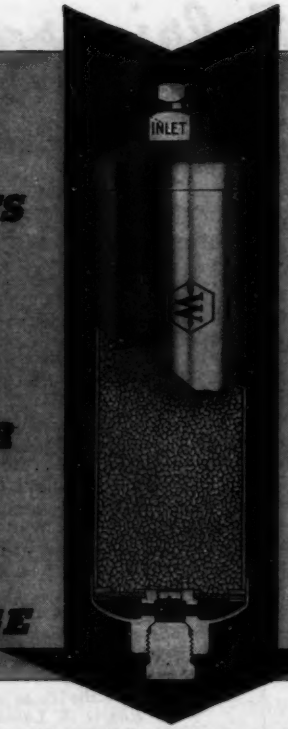
NO SOFT SOLDER

NO LEAKAGE



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Refrigeration Valves, Fittings and Accessories

The Refrigeration Service Engineer

Vol. 11, No. 8 CHICAGO, AUGUST, 1943 $2.00 Per Annum

Freon 12—Methyl Chloride

Here is some important information originally published in bulletin form for members of the Refrigeration Service Engineers Society. It will become more and more useful as the supply of Freon decreases.

By P. B. Reed*

IN 1941 there was quite a shortage of Freon due to the increase in usage of this refrigerant by the Army and Navy in new installations in Army Camps, Navy Yards, etc. This was a temporary condition which was soon alleviated, but since then the industry has been plagued with a shortage of cylinders, and more recently a more severe and probably a more lasting shortage of Freon-12 has developed.

New Use Discovered

The armed forces have discovered a use for Freon-12 not connected with refrigeration but as an insecticide which is of extreme value in saving the lives of American soldiers and sailors. The Army and Navy would like to have every pound of Freon-12 that Kinetic Chemicals are able to manufacture, even though Kinetic Chemicals are vastly increasing their production facilities.

Any Freon-12 that we civilians use or, in fact, that is used as a refrigerant in Army Camps or other military installations in this country simply means that much less for this new, more urgent, and vital need. It is, therefore, up to the refrigeration industry to not only conserve every pound of Freon-12 that we now have but to use absolutely no more Freon-12 in the future than is absolutely necessary. This mean that there will be some installations that will have to be down entirely for there is no substitute for Freon-12 for certain types of equipment.

Methyl Chloride

On the other hand Methyl Chloride can be used instead of Freon-12 in most installations with very little trouble or without reduction in capacity. Nevertheless the two refrigerants are not interchangeable. Their thermodynamic properties are different; some of their physical properties are very similar, but there are a number of points that must be considered when changing an installation from Freon-12 to Methyl Chloride.

* Service Manager, Servel Inc., and Chairman of the RSES Wartime Educational Committee.

1. For a given horsepower or wattage a machine designed for Methyl Chloride can give just as much capacity as one designed for Freon-12; but there is some reduction in capacity when we attempt to simply charge Methyl Chloride into a system that was designed for Freon-12 without making any changes in displacement. At air conditioning back pressures of around 40° F. evaporator there would be a loss of about 5% capacity changing from Freon-12 to Methyl Chloride, and on medium temperature installation at 20° F. evaporator there would be a loss of approximately 10%. At sub-zero temperatures (—40° F. to —60° F.) there would be a loss or around 30% capacity.

Offsetting Losses

On direct-drive machines or hermetically sealed machines where the displacement is fixed, the above would be true, but on belt-driven machines it would be quite possible to offset these losses by increasing the displacement of the compressor in the same amount as the reduction in capacity, namely 5%, 10% or 30% respectively. This could be done by increasing the compressor R.P.M. and the motor pulley diameter by 5%, 10% or 30% respectively. However, the manufacturer of the condensing unit should be consulted before this is done for it is possible that on a given condensing unit he may be already operating the compressor at the speed that he considers maximum for its design.

On water-cooled units it is possible to offset the reduction in capacity without changing the speed or the displacement if there is plenty of cold water available which would allow the condensing unit to be operated with much lower condensing *temperature*,—not pressure alone, for the condensing pressure with Methyl Chloride will, at the same condensing temperature be lower than the condensing pressure for Freon-12. In order to gain capacity the condensing temperature must be lower for the Methyl Chloride operation. The reduction of condensing temperatures and pressures can, of course, be made by adjustment of the water control valve. In order to obtain the lowest condensing temperature the water control valve should be set for the lowest operating condensing pressure possible which will still allow the water valve to close off after the condensing unit stops running.

2. There are no harmful chemical reactions of consequence resulting from mixing Methyl Chloride with Freon-12. Nevertheless, it is not a good practice and should be avoided wherever possible. The tendency is for the refrigerant to separate in the various parts of the system depending on temperature, and the tendency will be for the condenser pressure to correspond to Freon-12 and the suction and evaporator pressure to correspond to Methyl Chloride, which will, of course, result in considerable inefficiency of the system due to the abnormally high discharge pressures. However, if a system containing Freon-12 needs only a little refrigerant, Methyl Chloride could be added with perhaps little, if any, observable ill effects.

Adding Refrigerant

In general, however, if it is necessary to add refrigerant to a Freon-12 system the entire charge of Freon-12 should be withdrawn and replaced with Methyl Chloride. It is not necessary when withdrawing Freon-12 to blow the system out with nitrogen or CO_2 and wash the system out carefully as would be done if the change were from sulphur dioxide, and it is sufficient to merely pump a good vacuum and then recharge with Methyl Chloride. Obviously the Freon-12 should not be discharged to the atmosphere and lost but should be bled off into a cylinder and in order to get the refrigerant to pass into the cylinder the cylinder should be placed in a tub filled with cold water, preferably iced, which will accelerate the flow of Freon-12 and its condensation into the cylinder.

Care should be observed in removing Freon-12 (or any other refrigerant for that matter) from a water-cooled condenser, for if it is removed too rapidly the rapid expansion of the refrigerant may freeze up the water in the tubes in the condenser and burst them, which has been known to happen a number of times.

Methyl Chloride is lighter than Freon-12 and for a given volume of refrigerant the weight of refrigerant varies in the proportion of 7 lbs. of Methyl Chloride to 10 lbs. of Freon-12, so that if the system held 20 lbs. of Freon-12 it would be necessary in replacing this with Methyl Chloride to use only 14 lbs. Of course, this is only theoretically true and in actual practice the charge should be checked in the usual manner to be sure that you have the proper level of refrigerant in the receiver.

3. Generally speaking the same oil can be used for Methyl Chloride or Freon-12, although it is preferable to use a much more highly refined oil (even a water-white oil) for Methyl Chloride than for Freon-12. In either case the viscosity of the oil should be at least 300 seconds Saybolt at 100° F. The manufacturer of the condensing unit should, however, be consulted on this point, that is as to what oil to use in his condensing unit with either Freon-12 or with Methyl Chloride, and his recommendations followed implicitly.

When the Freon-12 is withdrawn from the system it contains a considerable amount of oil that it has picked up from the compressor. When the new Methyl Chloride is put into the system it too will pick up oil from the compressor and as a result the compressor oil level will be lowered. The compressor oil level should be checked very shortly after changing from Freon-12 to Methyl Chloride and again the next day and oil added as is necessary.

Boiling Points

4. The boiling points for Freon-12 are somewhat lower than for Methyl Chloride and this will, of course, affect the settings of the various pressure actuated controls, such as the low pressure control, high pressure cut-out, water control valves, and expansion valves. In order to obtain the same evaporator operating temperature the cut-in and cut-out point of the low pressure control will have to be lowered to settings corresponding to the desired evaporator temperature. For example, a Methyl Chloride setting of 26 lb. cut-in and 8 lb. cut-out would give approximately the same evaporator temperature as the previous Freon-12 settings of 34 lb. cut-in, 14 lb. cut-off. The high pressure cut-out setting should be lowered to approximately 175 lb. sq. in. cut-out with a cut-in pressure of approximately 40 lb. sq. in. lower. The water control valve should be set to operate the condensing unit at approximately 15 lb. lower condensing pressure than with Freon-12; although this will vary somewhat with the temperature of the cooling water and the ability to reset the water control valve iself.

If the system uses an automatic expansion valve it can simply be reset to the lower pressure corresponding to the desired evaporator temperature. If a Freon-12 thermostatic expansion valve is used it can sometimes be retained simply by readjusting slightly, particularly on installations such as air conditioning where the evaporator temperature and suction pressures are relatively constant. If the thermostatic expansion valve is the non-adjustable type or if the installation involves considerable variation in evaporator temperatures and suction pressures at the beginning or the end of the operating cycle then it will probably be found necessary to remove the Freon-12 thermostatic expansion valve and replace it with a Methyl Chloride thermostatic expansion valve.

Since Methyl Chloride has a very much higher net refrigerating effect per pound and per cubic foot than Freon-12 less refrigerant will be circulated for the same capacity of the condensing unit. Suction and discharge lines may be even smaller but this particularly affects systems using capillary tubes as the liquid control device. The capillary tube must have a greater restrictive effect for Methyl Chloride than for Freon-12. In fact, it must be approximately twice as long for Methyl Chloride as for Freon-12 if tubing of the same internal diameter is to be used. This is only approximate and a certain amount of experimenting will be necessary to determine the exact length.

Since the density of Freon-12 in liquid form is much higher than that of Methyl Chloride the float balls in high-side float or low-side float must be larger for Methyl Chloride than for Freon-12 in order to give equivalent lifting or seating effect. The manufacturer of the float should be consulted for a rework or recalibration of the float for use with Methyl Chloride.

Evaporators for Methyl Chloride

5. Most well-designed evaporators for Freon-12 can be used very successfully with Methyl Chloride, although the reverse is not true. The density of the Freon-12 vapor is much higher than that of Methyl Chloride and consequently with the same restrictive effect in the evaporator the pressure drop for Freon-12 is much greater than for Methyl Chloride. When the system is changed from Freon-12 to Methyl Chloride the very considerable reduction in pressure drop through the evaporator will allow the condensing unit to operate at a suction pressure corresponding more nearly with the effective temperature. Care should be taken that the expansion valve or other liquid control device allows for sufficient superheat to assure removal of oil from the evaporator.

6. In some installations which were designed for Freon-12 there may be a part exposed to the refrigerant that contains aluminum, since there is no reaction between aluminum and Freon-12; but this is not true in the case of Methyl Chloride. There is a chemical reaction between Methyl Chloride and aluminum which results in a heavy black precipitate which stops up valves and otherwise "gums up" the operation of the system. In addition, there is a gas formed that is highly flammable and even explosive which will sometimes spontaneously ignite when becoming exposed to the atmosphere. Most hermetically sealed systems have die-cast rotors which contain aluminum. Some condensing units have alloy pistons that contain aluminum. Therefore, the manufacturer of the condensing unit should be consulted as to whether or not there is any aluminum in his unit. Also, some evaporator coils used with Freon-12 are made of aluminum and the evaporator should, therefore, be inspected. Some control devices such as expansion valves or pressure reducing valves may have the body or a sleeve or a piston made of aluminum or aluminum alloy. This also should be checked. It takes very little aluminum in the system to cause a great deal of trouble.

Only Mildly Inflammable

7. Methyl Chloride is classed as a flammable refrigerant, although it is mildly so. Service Engineers who have tried to open a valve and light the Methyl Chloride will recognize how hard it is to do this, for very little pressure will blow out the flame; nevertheless it will burn under some circumstances and should not, therefore, be exposed to flame. For that matter Freon-12 should not be exposed to flame, for in the presence of an open flame Freon-12 breaks down and produces a highly dangerous and toxic gas known as phosgene, although Freon-12 itself will not burn nor support combustion. Methyl Chloride is somewhat toxic, that is it will make a person sick. It is not advisable to use Methyl Chloride in institutions such as hospitals where the patients might be helpless to get away from escaping refrigerant. Methyl Chloride needs no apologies, for it is a very efficient refrigerant and has many desirable properties. Service Engineers who have had experience with it since it first came into use over 20 years ago like it just as well as Freon-12 and consider it quite safe if ordinary precautions are taken.

8. Methyl Chloride in the liquid state will hold in suspension considerably more moisture than Freon-12 so that if there is some moisture in the system the tendency will be for the Methyl Chloride to absorb it so that there will be less free moisture to cause freezing at the expansion valve than before. Nevertheless this moisture causes corrosion and should be removed from the system by installing in the liquid line a dehydrator of adequate size depending upon the size of the condensing unit, and filled with Silica Gel, Drierice, or Activated Alumina; never use Calcium Chloride and never put into the system any of the so-called liquid drying agents.

9. After the system has been changed over from Freon-12 to Methyl Chloride it should be gone over very carefully for leaks using the same test for Methyl Chloride that would be used for Freon-12, namely a good Halide torch.

Our armed forces need the Freon-12 very badly and, in fact, with perhaps a few exceptions they need it far worse than we civilians need it. They are so anxious to obtain Freon-12 that they are denying it to the Army Camps and requiring that condensing units in Army Camps in this country be changed over to Methyl Chloride. We can do a distinct service to our boys at the front, especially in the disease-infested jungles of the South Sea Islands by furnishing them every pound of Freon-12 that we can possibly do without. Let's all of us get behind this really worthwhile activity.

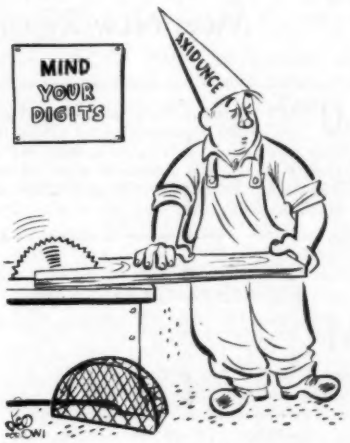
FORMER REFRIGERATOR SERVICE MAN NOW IN SEE BEES

DUTIES ranging from projects as large as construction of a dockyard to those as casual as fixing a potato-peeling machine on shipboard are all in the day's work to members of the Navy See Bees, an organization that is seeing service all over the world.

One of the famous ones of a group of 600 who disembarked recently at a North Atlantic port after nearly a year in British West Africa is James J. Blake of Detroit, a former refrigerator service man. His reputation as a refrigerator repairman and expert spread so widely that he was asked to fix the refrigerators of ships berthed in a nearby port and the refrigerators of a British hospital in the area.

Keeping Workers from Getting Hurt

The skill and strength of our industrial workers must be guarded against accidents and diseases so as to carry through the war production program. With this end in view, the committee to conserve manpower in war industries has compiled a list of do's and don't's to keep workers from getting hurt. This is the second of a series of articles prepared by the United States Department of Labor so that all workers can check the hazards applying to their own jobs and safeguard life and limb in their own interest and that of war production.



Personal Protection

1. Wear snugly fitting clothes. Never wear loose clothes, long sleeves, dangling neckties, loose trouser cuffs, finger rings, or other unsafe apparel while working around machinery.

2. Wear suitable gloves and gauntlets when handling sharp-edged stock, scrap, or quantities of lumber.

3. Wear goggles when grinding, snagging, chipping; pouring hot metal, caustics or acids; welding, sandblasting, or doing any other work where flying or splashing material might enter the eyes (unless an effective non-shatterable shield is installed on the machine). Do not interchange goggles, masks, or other personal protective equipment without first having them sterilized.

4. Wear shoes with soles sufficiently heavy to give adequate foot protection. Use safety shoes when handling heavy objects.

Machinery

1. Stop machine or other dangerous operations while listening to instructions.

2. Before cleaning, adjusting, or oiling a machine, make sure that the power is off.

3. Never reach over moving cutters, rolls, or other dangerous machine parts.

4. Always remove chuck wrenches from chucks immediately after they have been used.

5. Stand out of direct line with rapidly moving or revolving machine parts from which objects may fly. Do not stand in line with materials being fed to circular saws or jointers.

6. Always use a push stick when feeding short or narrow work past saws or knives. Keep fingers away from moving parts.

7. When operating any machine, do not lean over the work so that your hair or clothing may be caught in any moving part.

8. Do not start any machine unless safeguards are in place and working properly. Machine guards may be removed only to make necessary adjustments and repairs, and must be replaced before the machine is again put into operation. If guards become broken or inoperative, the machine should be shut down until it can again be operated in a fully guarded condition.

9. Never attempt to stop a machine by grabbing the belt or by using any part of the body as a brake.

10. When replacing belt, stop machine and adjust belt on driver pulley first.

11. When shifting a belt, use belt shifter or a small metal or wooden rod. If you must shift by hand, always use the palm with the thumb and fingers extended.

12. Metal belt fasteners should never be used on hand-shifted belts.

13. Remove chips or materials from around moving machine parts with a brush or stick, never with the hand.

14. Keep loose materials away from machinery. Do not use rags or waste around moving machinery parts.

15. Machines should be stopped before attempting to pick up tools or other objects lying near or in the path of traveling parts.

16. Always turn off the power on a machine before attempting to remove stuck or jammed pieces of material.

Service Pointers

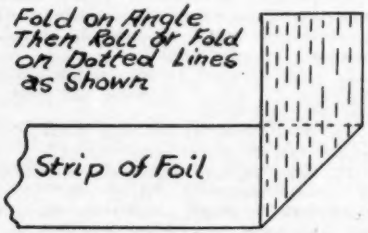
Practical Service Men Tell How They Meet New Repair and Service Problems

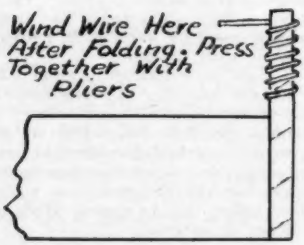
UNDER this department a number of practical service men show a commendable cooperative spirit in passing on to others information on special repair and service problems that may be of much value in these trying times of material scarcity and shortage of competent help. We believe if more readers would send similar contributions, making THE REFRIGERATION SERVICE ENGINEER a medium for the exchange of information on service, much benefit would accrue to all. Similar contributions are solicited from all readers.

REPAIRING CAPACITORS

MANY times a capacitor breaks down at the leads to the terminals. I take the fiber terminal end out of the can and by heating and shaking hard, the roll of foil will come out of the can, then unroll the foil carefully. If the two sheets are not burned through except at the end, proceed as follows:

Cut off the bad part, a foot or so won't be too much, then refold as shown in the drawing. Wire can then be wound around the new tabs and the whole thing either put back in the can and waxed or wrapped with friction tape. I have some of these repaired capacitors that have run three years and still going. When wrapped with tape and long leads put on they are very satisfactory for temporary use while a new one is ordered.





DISPOSING OF DISCHARGED SO_2

A SOLUTION that may find favor with the individual asking question No. 558 is one that was worked out here. Put up a 30 or 40 ft. flag pole or radio mast. Call it what you will, but on the inside, run a tubing line to come out at the top. This line is connected to a large expansion tank in the shop. The procedure is to connect the unit to be discharged to another valve on the expansion tank and from there on, of course, as it vaporizes it goes on up the tubing in the mast and out into the air above any surrounding trees or houses.

Provision should be made on the large tank in order to be able to draw out the oil from time to time. The above method has been in use for over a year and a half without any ill effects or complaints of the residents residing around the shop using this method. The tank in use is about 3 ft. in diameter and 5 ft. long, though a smaller one might do in this particular setup.

SO_2 PROTECTION

I HAVE found that if you know you are going to come in contact with considerable SO_2 fumes the following helps protect the throat. Take a couple of strong cough drops in your mouth and breath through your mouth only.—M.A.T.

FRIGIDAIRE FIBC BOTTLE COOLER

By C. A. Reichley

IN RESPONSE to one of the questions in the Service Pointers Department on page 19 of the July, 1943 issue.

This question concerns a Frigidaire Bottle Cooler, Model F1BC. This machine is not, as the writer sugests, a capillary tube machine but a high side float. The service valves for the compressor are located under the two bonnets of the cylinder head of the machine, 3/16 in. valve stems are recessed beneath these bonnets. The service ports are located on opposite sides of the cylinder head. Facing the compressor from the rear of the cabinet, the plug in the cylinder head is the suction port. A long shank ¼ in. flare by ¼ in. flare will serve the purpose for connecting gauge or tube.

In adding Freon 12 to this system, connect drum to suction side and charge in Freon until the float receiver tank becomes hot to the touch, then disconnect drum and start machine in operation. Be sure to check for Freon leaks. Sometimes the tubing leading from the inside of the cooler to the compressor rubs against the machine compartment roof and wears holes through the tubing.

S S S

RUBBER MOTOR MOUNTINGS

By W. C. Johnson

IN YOUR June issue, Service Pointers, C. A. asks about oil soaked rubber motor mountings. I had trouble getting new rubber mountings for GE and Delco fractional HP motors. Using a piece of ⅛ in sheet lead discarded by plumber installing sewer line, I cut strips ¼ in. wide and long enough to form around hub on motor after cutting away the rubber. Two strips were necessary. On the GE motors, having a clamp, this worked fine and on the delco motors, lead strips were driven in with a hammer.

S S S

POLISHING CYLINDER WALLS

TO SAVE time in cleaning up compressor bodies with the cylinder walls in bad shape, I cut a leather disc out of sole leather just a little larger than the bore. Then punch a hole in the center and mount on a long ¼ in. bolt with the head sawed off. Two nuts on the bolt will hold the leather disc chuck in a ¼ in. drill and work up and down in cylinder using dry powdered bon ami a swell job is the result.—M.A.T.

REPAIRING ECCENTRICS AND ECCENTRIC STRAPS

By Kenneth Shea

ONE way of repairing worn compressor eccentrics and eccentric straps which cannot be easily obtained is to cut a short section out of the strap, close it in so as to reduce its diameter, then braze or weld and rebore it.

Many of the older compressors were equipped with bronze eccentric straps and these in particular are easy to repair in this manner. Cast iron straps are a little more difficult but can be successfully repaired if the entire rod is preheated to a red heat after the piece is cut out and before they are closed in and welded.

A light cut can be taken off the eccentric to remove any ridges worn in it and to make it round once more. Then the eccentric strap can be rebored to fit the eccentric. Be sure to maintain the same length from the eccentric shaft to the top of the piston during this repair so that too much clearance will not be obtained between the piston head and cylinder head.

S S S

EMERGENCY MOTOR MOUNTS

By M. A. Taylor

ON THE G.E. and some other small motors with round, rubber mounts with a metal band around and a split clamp to hold them in the base, I have had good luck making repairs like this: Cut off all the old rubber, save and clean the little steel bands, take an old "B" width belt that isn't too bad and wrap it around the place where the old rubber was, cut it so the ends just meet. Slip the steel band over. These usually are split and will open up a little. Now force the motor back in the cradle base and draw up the split clamps. These really work swell, the belting will squeeze down into the notches in the motor end bell and are as strong as the new ones.

S S S

A REPLY TO S.J.F.

THE Help! Help! column of the July issue has a problem presented by S.J.F. referring to an F1CB unit in a bottle cooler which is no doubt a No. 1 valve in head body with a ⅓ hp. motor. The service valves for this compressor body are built into its head and by removing the large nuts on the side he can control gauge ports with a long quarter-inch adapter and render such service as is necessary.

REBUILDING BRONZE BEARINGS

By Glen T. Blake

IN THE June issue of REFRIGERATION SERVICE ENGINEER is a question by D. F., "How Can Bronze Bearings Be Rebuilt?"

Sometimes the correct new bearings cannot be obtained even with priority, so it is often necessary to rebuild the worn ones. Unless a shop is equipped with adjustable reamers and bearing pullers I believe it best to send bearing jobs out to a shop equipped for it. Besides a complete set of reamers it is almost as necessary to have a lathe. However, many jobs can be done without a lathe.

From experience we find that a large percent of motors needing new bearings also have cut or damaged shafts caused by foreign matter getting into the bearings or due to lack of proper lubrication. This presents a problem much more difficult to solve than if just the bearing needs replacing.

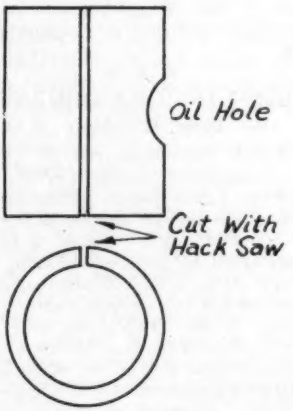
If the bearing surface of the shaft is damaged it must first be built up by welding and then turned down to the proper size on the lathe. Before turning down on the lathe, however, the armature must be checked to see if the shaft has been pulled out of alignment due to the heat of welding. This almost always happens. This can be checked by placing the armature or rotor between the lathe centers. Dial indicators are best for this, but a piece of chalk held by or against the tool post can be used. Turn the armature by hand and the chalk will mark the spot on the armature that is farthest from center.

Remove the armature from the lathe and heat the shaft with Prestolite or blowtorch where the weld was made. This heat being much lower than welding heat will not aggravate the situation but only make it easier to bend the shaft back into position. Place shaft on vise or anvil at inner end of weld and hit end of shaft to bend it back into position. Place armature on lathe and check it again. Repeat this process until the shaft is straight. This is very important. If the armature or rotor is not exactly true it might rub or hit the stator. Even if it doesn't hit the stator, if the air gap is not even all around the motor will vibrate and the bearings will wear out prematurely.

Assume then that the armature is true again. The next job is to turn the bearing surface of the shaft down to the desired size. Unless the old bearing is very badly worn it can be used over again without even removing it from the end bell. In turning down the shaft do not turn it down to the original diameter but leave it oversize. Then ream the bearing to fit.

There is a word of caution necessary here. If it is an armature it is very important that a piece of thick asbestos be soaked in water and put over the shaft and up against the windings so that the welding heat will not damage the windings. The asbestos must be kept wet. If it is a rotor this precaution is not necessary.

If the armature shaft is good and only bearings need replacing the bearings can be made over again as follows: Remove bearing from the end bell. Saw a slot in the bearing as shown in illustration. With a vise carefully press bearing so the two edges of the slot come together. The width of the cut will depend on how badly the bearing is worn. Usually the thickness of a hack saw blade is enough. In pressing the bearing with the vise or press rotate the bearing so it will be pressed from all sides. It will not be perfectly round but if a little care is taken it can be pressed quite round.



Then with ordinary solder put a coat around the outside of the bearing. While solder is still hot shake off the excess solder. It only takes a thin coat all around the bearing to give it enough thickness to fit the housing. This thin coat of solder will not compress enough to allow the bearing to become loose in the end bell. In some cases we have had to put quite a thick coat of solder around the bearing. When this is done the bearing is set in lathe and the coat of solder cut to an even thickness. It is surprising how much a bearing can be shrunk

this way and still made tight by using solder around the outside. Have the solder a little thicker than the diameter of the housing would call for so that in pressing the bearing in the housing it will force a slight coat of solder off the outside. The bearing will then be tight and be almost good as new. A regular bearing puller is quite necessary because if the bearing is driven in it might be driven in crooked. If a press is used care must be taken to press bearing in straight.

We have never had a bearing treated this way come loose in the end bell. However, we have not used this method on motors over ½ hp. Larger motors are almost always used on equipment entitled to priority and new bearings are more readily obtained for the larger motors. On the smaller motors this method has proved to be highly satisfactory.

After the bearing is installed it must be reamed so that it is perfectly round on the inside, and of the right inside diameter to fit the shaft.

Sometimes a bearing is found to be reamed one sided so that it doesn't line up with the opposite bearing. To avoid this it is important that in reaming, the reamer handle be held perfectly straight. Occasionally when the bearings do not quite line up we have found it possible to pull one of the bearings and turn it around 90 or 180 degrees and make it work. In making repairs of this kind we find it is best not to ream the bearings enough to allow the shaft to turn free. Leave them tight enough so the shaft is still quite hard to turn, just so the motor will start when cold with no load. If the bearings are then a little out of line they will wear at the points of pressure and when the motor is run in the bearings will be quite true.

It is evident from the above descriptions that adjustable reamers are necessary and that line reamers won't do because in fitting the bearings on any of the above methods the two bearings might not be of the same inside diameter.

In running in a motor when the bearings are tight the repairman can go ahead with another job, watching the motor to see that it doesn't heat. At first it can only be run possibly a half minute or less. Then let it cool and run it again. Each time it can be run a little longer until the bearings are run in.

During the running in process it is best to leave out the oil wicking. Keep the bearing flushed with oil. This can be done by hand or by rigging up an automatic oiler. A funnel can be made into an automatic oiler and suspended directly over the bearing. Pinch the end of the funnel until a hole is left just large enough to allow the oil to keep the bearing flushed.

After bearings are run in, put in oil wicking. Take motor apart and clean out excess oil that might have flooded the motor during the running-in process. Check for proper end play or any other adjustments that should be made. The motor is then ready to be delivered to customer or put into service.

HELP! HELP!

NEW problems for the service engineer which in turn create new questions, answerable only from experience in the field arise every day. Readers are invited to submit questions on which they would like to have information as to what others are doing. Answers are solicited from readers and will be published in the "Service Pointers" department.

LET OWNERS MAKE REPAIRS

Have any of the service organizations developed a program to teach users to make minor adjustments or take care of troubles which in these times would not justify a service call? If so, I would appreciate hearing about it.—H.B.

S S S

TROUBLE DETAILS OVER PHONE

A thoroughly trained and experienced person to receive calls over the telephone is more essential than ever these days so that unnecessary calls can be eliminated and the trouble explained over the phone. Shortage of experienced help, however, makes it almost impossible to keep a capable person in this position.

I am wondering if anyone has worked out a method of obtaining the details from the customer regarding the trouble from which a service man, when available, could make an analysis and call the customer on the phone.

I have in mind something like a definite set of questions which would act as a guide for an inexperienced girl handling this work. —B.H.

S S S

The average American family can collect, and turn in, 16 tin cans in two weeks. And that's enough tin for a machine gun.

QUESTIONS AND ANSWERS

On Interpretations and Rulings on Government Orders Covering Refrigeration Sales and Service Bulletins

BECAUSE of the interest in Government war regulations pertaining to the refrigeration service business, THE REFRIGERATION SERVICE ENGINEER answers below a number of individual questions on the application and interpretation of the above regulations. The answers to these questions have been checked carefully for accuracy. However, since government regulations are subject to constant changes and modifications, we cannot guarantee the correctness of answers beyond the date of the issue in which they appear. Readers are invited to submit questions pertaining to their individual problems.

PRIORITY FOR GROCERY REFRIGERATOR

QUESTION 33: Please let me know what is the best priority that I can apply for a grocery store's refrigerator which is completely down for the lack of a motor. The old one burned up and is beyond repair. I am operating under an emergency service agency classification. I could not obtain one with AA-4 rating.

ANSWER: Under Order P-126 an emergency service agency is not granted priority higher than AA-4 for the application described, but apparently this is not sufficiently high to secure the new motor. Possibly the WPB office in St. Louis would handle this application on Form PD-333 under general emergency repair provisions. This is described on page 27 of the July issue of the REFRIGERATION SERVICE ENGINEER. You should find out where the motor can be obtained and what priority is required, as well as the price of the motor. Your customer would then telephone the WPB office in St. Louis and request emergency repair service under PD-333. I assume he could make a good case regarding the need for this motor in order to protect necessary food in his community and that WPB will consider his case merits emergency treatment. If so, WPB will advise the supplier to ship the motor and provide the necessary priority.

Your question does not state the size of the motor but this is an important consideration. Under Order L-221 your customer is required to try to obtain a used motor from three different bona fide sources before he requests a new motor, if the motor is one horsepower or larger.

RECORDS SHOW DUPLICATE ORDERS

QUESTION 34: If an order for supplies that are rated P-126 is returned by the supplier because he does not have the supplies, but says to reorder in a short time; then what would happen if government representatives learn that these two duplicate orders were placed within a short time? I would not have anything to show that I did not receive this order, as the bills do not state this and list only the items I really received, thus I would not have any proof of not getting them. What should I do so as to be absolutely sure of being right in case government representatives make a close checkup?

ANSWER: As long as you follow the spirit of the order and keep your records straight, we feel certain that you will not encounter any difficulties from investigations made by the WPB Compliance Division.

In regard to your specific question, we note that "the supplier . . . does not have the supplies but returns the money and says to reorder . . ." If the supplier is in your city you can request a memorandum to this effect which he will sign and give to you. This memorandum can be attached to the order and placed in the file and will indicate the exact course of the transaction. If the supplier is not in your city, he probably will send you a letter or some memorandum which you can handle in the same fashion and thus have evidence that the repeated order is not a duplicate of the order to obtain material illegally. If you will follow this system, we are confident you will have complete protection against any charge of duplicating orders. Your bills will also indicate when partial orders are shipped.

News Briefs on War Regulations

Reports on Freon Stocks

MONTHLY inventory reports as required by Conservation Order M-28 must be made regardless of whether the refrigerants are held by owners for their own use or for resale, the War Production Board said July 29 in issuing Interpretation 1 of the Order, as follows:

a. *Reports of inventories.* The reporting requirement of paragraph (j) (2) of Order M-28 [§ 970.1] must be complied with regardless of whether the chlorinated hydrocarbon refrigerants are being held by the owner for his own use or for resale.

The paragraph requires every person (including the owner of a refrigerating or air conditioning system) who has in his possession, on the 15th day of any calendar month (commencing with the month of July), more than 500 pounds of any type of chlorinated hydrocarbon refrigerants, or who sold more than 2,000 pounds of such a refrigerant during the preceding calendar month, to file a report on Form WPB-3054 with the War Production Board on or before the 20th day of the month.

Each "person" as defined in the order, must report the aggregate quantities in his possession (including stocks of less than 500 pounds located at various places) if the total is more than 500 pounds.

The report must include all amounts not actually being used in refrigerating or air conditioning systems. Thus the owner or operator of a system who has more than 500 pounds in his possession must report his entire supply except for the minimum operating charge actually installed in his system. Any additional amount which he may have must be reported, whether kept in cylinders, a storage receiver or other form of container. However, if a minimum operating charge is being temporarily held in a container while the system in which it had been installed is being repaired, it should not be reported.

An equipment manufacturer who has more than 500 pounds in his possession on the 15th day of any calendar month must report his entire supply except what has been actually installed as an operating or holding charge in accordance with his regular manufacturing practice.

b. *Charging of equipment manufacturers.* Paragraph (g) provides that no user, supplier, contract agent, or producer shall deliver, or cause to be delivered, to the owner of any system any chlorinated hydrocarbon refrigerants for use in, or for resale for use in any system of the types described on List B.

This restriction is intended to prevent charging any system of the types included on List B with chlorinated hydrocarbon refrigerants except for a person who was operating a system and had the necessary refrigerants in his possession on the effective date specified in List B. Therefore, a manufacturer may not charge any such system with chlorinated hydrocarbon refrigerants before delivery, and he may not deliver the refrigerant separately to be used in charging the system. However, he is not restricted from delivering systems which had already been charged with such a refrigerant on the effective date specified on List B.

S S S

Delivery of Freon

DELIVERY of chlorinated hydrocarbon refrigerants (Freon) to those who use it in refrigerating equipment for dispensing and storing carbonated or malt beverages is prohibited by an amended order issued July 12 by the War Production Board.

The order (M-28) establishes more rigid controls over the use of chlorinated hydrocarbon refrigerants. It sets up eight classes of users of chlorinated hydrocarbon refrigerants. The first three classes cover the refrigerant's use in new or existing refrigerating and air conditioning systems of the Army, Navy, Maritime Commission or War Shipping Administration.

The fourth class covers maintenance of all essential commercial and industrial refrigerating and air conditioning equipment as well as household refrigeration, but excludes refrigeration equipment used solely for storing or dispensing carbonated or malt beverages and comfort cooling systems as defined in List A attached to the order.

The fifth class covers refrigerants used for charging refrigeration and air conditioning systems on hand by the Army, Navy, Maritime Commission and War Shipping Administration with the exception of cooling systems.

Charging new equipment, except comfort systems, by an equipment manufacturer, also excepting equipment for the Army, Navy, Maritime Commission and War Shipping Administration, falls in Class Six.

Class Seven covers refrigerants used solely for storing or dispensing carbonated or malt beverages. This class does not include

such systems where they are owned or operated by the Army, Navy, Maritime Commission or War Shipping Administration.

The eighth class is for refrigerants to be placed in inventory.

Allotments of refrigerants will be made each month from the available supply to suppliers in accordance with these eight classifications. The amount to each depend upon the supply.

The use of refrigerants for comfort cooling systems continues to be prohibited by the amended order and it is expected that the demand for refrigerants will continue to exceed the supply for some time to come.

S S S

Distributors' Form

FORM PD-1X, used by distributors in obtaining priority assistance for replacing inventories, has been superseded by a new, simplified application titled WPB-547, the Wholesale and Retail Trade Division of the War Production Board has announced.

Intended primarily to reduce the amount of paper work involved in filling out the old form, the new application has been simplified in design and appearance.

The new form, copies of which are now available in WPB field offices, can be used immediately if desired. PD-1X applications will be accepted for processing until August 1; after that date, only the new WPB-547 will be valid.

Many of these forms are being returned, according to W P B because of failure to fill out the blanks properly. The blanks, used by distributors to obtain priority assistance for replenishment of inventories should be filled out carefully and all information called for should be provided. Otherwise, no action can be taken on the application and there will be no alternative but to return them to the applicants.

S S S

Small Motors

THE sale of a fractional horsepower motor to replace one broken down is considered a maintenance and repair transaction, where the broken one is taken in by the repairer.

This transaction, according to an Interpretation issued by the War Production Board, comes within the exemption provided by Order L-123, covering the delivery of maintenance and repair parts.

Rental Basis Revised

MECHANICAL refrigerators which are rented to resort users on a seasonal basis have been exempted from the flat-rate provisions for refrigerator rental in cases where the supplier was making such seasonal rentals prior to April 1, 1942, the Office of Price Administration announced July 14.

Rates and charges for this type of rental hereafter are to be determined under the method used for seasonal services in Maximum Price Regulation No. 165 (Service), where the dealer placing the refrigerator on rental has customarily rented refrigerators on a seasonal basis prior to April, 1942. If, however, the dealer did not rent mechanical refrigerators in this manner before that date, the maximum rental rate is to be determined by specific authorization from OPA.

This ruling appears in Amendment No. 1 to Revised Maximum Price Regulation No. 139 (Used Household Mechanical Refrigerators), effective July 20, 1943.

S S S

Commercial Standard Extended

THE United States Department of Commerce has announced to all users, distributors, installers and manufacturers of refrigeration condensing units that the effective date of Commercial Electric-Refrigeration Condensing Units, Commercial Standard (Emergency) CS (E) 107-43, has been extended from May 15, 1943 to six months after cessation of actual hostilities, or to such earlier date as may be recommended by the Standing Committee, for the following reasons:

1. It is a practical impossibility under present emergency conditions to obtain all of the necessary materials for compliance; and

2. It is impracticable to make the engineering changes in design and construction required for conformance with the standard.

S S S

Water Coolers

PRODUCTION of special self-contained drinking water coolers for use aboard ship is permitted for an indefinite time, under a War Production Board action.

An exception to regulations governing such production expired on July 6, and the indefinite extension was requested by the Services.

COMMERCIAL

INCREASE BUSINESS BY DOING A MORE EFFECTIVE JOB OF SELLING *Selling*

Ironing Out The "Bugs" in Refrigeration Service Makes Smoothly Operating Organization

By Robert A. Latimer

WHEN Paul Renaud, now president of the Renaud Frigidaire Service Company, Montgomery, Alabama, went into the service field several years ago, one of the first things he did was to sit down and "iron out the bugs" which were most likely to make the business unpleasant. He had been a service agent for a large commercial refrigeration distributor as well as an air conditioning installation engineer, and he knew that with the war coming on, a smoothly-operating business would make the difference between success and failure.

Good Planning Creates Efficiency

"As long as I've been connected with refrigeration I've heard service company heads moaning about headaches, breakdowns, inefficiency and mishaps which put grey hairs on their temples" Mr. Renaud grinned. "And I resolved that when I opened my own company, that the only logical way to compensate for each 'bug' was to take care of it in advance. Now that the war has placed a heavy strain on us, we're functioning as efficiently as possible, and I'm glad to say with as little interruption as good planning can provide."

The company currently employs three service mechanics and a crew of colored helpers. It features domestic refrigerator repair, rebuilding and reconditioning of refrigerators for Montgomery dealers handling used boxes, as well as maintenance and repair of commercial refrigeration and air- conditioning installations in the Alabama capital. Though there is actually enough work in any one of these fields to keep the firm busy, Mr. Renaud believes in spreading his efforts "out wide" and handling as diversified a business as possible.

"We're planning to expand considerably after the war" was his explanation. "And I wanted to have a background in each specialty to build against." Consequently, he is now handling a route of bottled-drink coolers, dairy cases, grocery store sharp-freeze cabinets and other commercial refrigeration above the standard field. The Renaud Frigidaire Service Company has been a bit "choosy" about taking up contracts with refrigeration-using organizations, and thus has a profitable series of connections.

The first "bug" which Mr. Renaud went to work on was the common lazy habit of refrigeration users of letting needed work go until warm weather made it necessary. For example, air conditioned department stores, shops, restaurants, etc., invariably piled in orders for start-up and check-up service on the first warm day of spring.

Work Started Early

To combat this piling up of work which put a strain on the firm, Mr. Renaud begins aggressively suggesting that all work be done in the late days of February or early days of March. To make his suggestion "stick" he worked up a form letter sent to all refrigeration and air conditioning users explaining how the war has affected manpower, parts and time, asking every prospect who would need inspection or adjustment work later on to have it done during the comparatively slack early spring season.

When the shop wasn't busy he sent his three men out to make personal calls on such prospects; made many more himself. As a result, most of 1943's more difficult start-up jobs were done and over with before spring was fairly under way. Mr. Renaud was even successful in getting the Montgomery Fair, a large department store, to turn over its compressors and cooling machinery in late March for repair six weeks ahead of time.

The same theme is pushed with homeowners and grocery store proprietors, via direct mail, telephone calls and personal visits. On the very reasonable basis that the work may not be possible later on, Mr. Renaud had all but 15 per cent of his early-summer reconditioning work on meat market and grocery store refrigeration done by April 15.

Time Wasted in Home

Second, Mr. Renaud went over the "bug" of wasted time in the customer's home, both by the housewife and the serviceman. The first thing he did was to set up a rule whereby no Renaud Frigidaire Service Company man will go to work on a customer's box until it has been arranged for service, food taken out, space cleared, etc. The customer is told that this is necessary, and that no service man has time to do this small amount of extra work for her.

On the serviceman's side of the picture, Mr. Renaud has taken care of lost minutes equally as well. "Our men lost time by forgetting tools, mislaying them, dirtying the floor and having to clean it up, and making frequent trips out to the truck," he explained. "Consequently we designed a handy tool carryall which must come in the house with the mechanic, guards against soiling the kitchen, and removes any chance of forgetting or losing tools."

This is a light metal framework on wheels, with a canvas receptacle swung between the sides. Resembling a baby's walker, the canvas section accommodates all tools necessary, keeps them off the floor, and can be wheeled into the house (or store) with one hand. There have been no complaints from housewives indignant over the appearance of their kitchens, or no time lost through mislaying tools since this simple improvement went into effect.

Puts Shop on Show

Third, to identify exactly his shop and the kind of work it handles. Mr. Renaud has put the "shop on show." Rather than using dimly-lighted rear rooms for all repair work, the majority of it is carried out immediately behind bright-lighted show windows in the Renaud building on one of Montgomery's busiest streets. Here, where thousands of people pass, mechanics handle everything from tearing down a heavy reciprocating compressor or to repairing small electric appliances, wearing white coveralls, and giving an impression of quiet efficiency which goes a long way toward creating future business.

"We have had a lot of women tell us that they did not know the name of the shop, but remembered its location from seeing the work done behind the display windows," Mr. Renaud said. "So they look in the telephone book and pick us

(Continued on page 38)

Air Conditioning Builds Business Advantages Case Study Balances Value and Cost

By Phil Glanzer

MR. and Mrs. Public are elusive and fickle. Yet, these two characteristics really provide the opportunity for the alert merchant to capture more than his share of the available business.

How to hold present volume, and in addition, attract new business; these are the age old and continuing problems of every retailer. Good location, long experience, selected stock, trained organization, balanced advertising, all contribute to the complexity of this problem. Always, the solution must be the right one to make black ink the dominating ledger color at the end of the year.

But competition involves more than just seeking for the customer's dollar; it includes the division of the merchant's dollar, that dollar that has come from customers, and must be converted so as to attract even more customers.

Whether the merchant's problem is one of constructing a new building, remodeling a new location, or modernizing his present store, a program for business increase must be decided. For the small business, these promotional decisions may never be reduced to writing, but they will be firmly fixed in the mind of the owner of the business. This is where the competition enters for the merchant's dollar.

Financial Questions

Cost? Price? How much? These, and all the other financial considerations reduce to the common denominator "What is the VALUE of the proposed expenditure in connection with increasing business and profits?" During the past few years, this approach to improve facilities for merchandising has been dominant. A simple viewpoint that helps to eliminate confusion and lead to a wise decision can be expressed in a truism that the "value of the proposed improvement must exceed the cost."

As an example, let's consider the first large air conditioning installation in a New York motion picture theatre. The cost of the equipment was considered to be an unbearable burden on the overhead. It took only three months' operating profits, however, to pay for the new business builder. This is a practical demonstration of the value of an expenditure exceeding the cost. Now, let us review four important factors in the consideration of store improvement. These may be classified as the means of attracting new trade, holding present customers, reducing overhead, and increasing revenue.

Location Affects Patronage

Every store has its location that invites patronage. Once inside, the prospect is greeted by the display of merchandise. Modern equipment and attentive salesmen serve the visitor. Wide aisles, good illumination, easy chairs, etc., help to provide for the comfort of patrons. What else can be done to attract new trade by making shopping a comfort in any particular store, and especially during those months when bodily comfort influences the good nature and patience of the public?

An apparel store in Worcester, Mass., reports saleswise, that: On one of the hottest days of the summer, a lady dropped in and asked if she might wait to cool off, remarking that she didn't want to buy anything but would appreciate the opportunity to be comfortable a moment or two. Not far away was a fur coat on display, which she finally walked over to and examined. Attracted solely by the air conditioning, she left as the purchaser of a high priced fur coat.

Many merchants have realized the pulling power of the store that displays the sign "Air-Conditioned." Such an identification has proven its ability to attract trade, not only because of the patron's expected comfort but also because the cooled, dehumidified, and gently circulated air promotes the courtesy of employers. Merchandise, and even paper containers, are susceptible to losing their fresh appearance during hot, humid weather; and even in the heating season when the proper amount of humidity is lacking in the air.

This is emphasized by the fact that many users say, substantially, "Of course, we are expecting to get beneficial results through the winter operation of our air conditioning. The customers and employes are going to enjoy clean, fresh air and uniform temperature through the store, something which we have not been able to accomplish in the past." Thus, air conditioning demonstrates in many ways its ability to increase the prestige of the store that overcomes the undesirable condition where there is no difference between indoor and outdoor weather.

Competition often works in its subtle way to take patrons away from their regular trading places. Here, air conditioning has proven its defensive value in holding present customers. Obviously, a customer would prefer to go back to the store that has earned his preference by providing for his comfort. Such a customer may even have his pride stimulated, because his favorite store has identified itself with modern provisions for the comfort of the public. Any show of interest in the patron's welfare is certain to win recognition. The experience of a department store, in this connection, is interesting:

They report a recent questionnaire answered by nearly 1,000 customers on various floors registered their freely given opinions as follows:

Ideally comfortable	82.5%
Comfortably warm	7.2%
Comfortably cool	8.2%
Too warm	1.2%
Too cool	.9%

This is a vote of confidence more convincing than any comments which the department store might make. There are, no doubt, many tangible benefits, such as increased sales, lower cleaning costs, less soilage of merchandise, etc., but to them the intangible benefits that come from customer and employe comfort, health and good will, are of far greater importance.

It is not surprising that reduction in overhead expense accrues to the air-conditioned store; in fact, such a result is most logical and noticeable because doors, transoms, and all other openings may be kept closed when not in use. Consequent elimination of spoilage and soilage is evident; cleaning and renovating costs are reduced; and there is a general increase in efficiency of the sales people due to the ideal conditions in which they work.

Salespeople Sell Better

One apparel shop says that, not only have their customers favored them with more business, but their own sales force has demonstrated the advantages of air-conditioning. They have done a far better selling job, given customers greater service, and remained more alert and less fatigued throughout every hot spell. . . . Obviously, an employe would be reluctant to leave such favorable working conditions.

Increased revenue is the fourth major result that has come to stores that have already invested in air-conditioning. It is interesting to observe the way patrons tarry to browse around the air-conditioned store, reluctant to leave for the less desirable outdoor weather. This extra time enables them to be attracted to merchandise other than the items included on their shopping list. The net results is an increase in sales per employe, as well as total gross.

These examples point to the *value* of an investment exceeding its COST. The retailer who is usually operating on a narrow margin, has the ever recurring problem of making those improvements

(Continued on page 42)

The Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment to "The Question Box."

STEWART-WARNER SHORT OF REFRIGERANT

QUESTION 554: I was called on a Stewart-Warner Dual Temp refrigerator the other day, the complaint being that the freezer compartment was not freezing at all and the food compartment was very warm. In checking the machine, I thought at first that the thermostatic switch was out of calibration, but after I disconnected the thermostat and connected the two leads, I let the machine run for about fifteen minutes. After this length of running period, the temperature in the freezer had not changed, but the food compartment was good. I came to the conclusion that my switch was okay.

ANSWER: We are of the opinion that the trouble with the refrigeration system was a shortage of refrigerant caused by a leak. Therefore, the first step is to add some refrigerant to build up the pressure, locate the leak and repair it. Then recharge the system with Freon (F12).

In charging, add the refrigerant until the suction line frosts. Then purge off the excess refrigerant until the suction line barely gets cool near the beginning of the cycle at the point where it comes out of the cabinet.

If the model in question has an aluminum evaporator plate in the upper compartment, be sure to check this part carefully for leaks.

In addition, if the refrigerator did not run until you put the jumper across the thermostatic switch terminals—the thermostatic switch is also at fault and should be replaced. However, keep in mind that the thermostatic switch is in the upper compartment and may have cut off since you state that the upper compartment seemed to be operating normally.

CONTROLLING A MULTIPLE SYSTEM

QUESTION 555: We have a grocery store and meat market combined here that has had trouble with their refrigerating system in the meat department ever since it was installed — especially in the winter. I was called in to repair it this winter, and will try to explain what I found and what I recommended.

They have a display meat case, a display fish case and a wall box for butter and lard —all three are in a room held at a temperature of 65°. In the back room, they have a walk-in cooler for meat and a walk-in cooler for vegetables. The temperature of the room in which these coolers are located runs from 34° to 55°. All of the equipment is operated by one compressor in the basement. They want a 34° temperature in the meat case, 28° in the fish case, below 50° for the butter box, 32° to 34° for the walk-in meat box and 40° in the vegetable box. All the boxes have fin coils and thermostatic expansion valves, except the vegetable box which has a blower coil. The refrigerant is methyl. The compressor has a pressure switch (a Pollytron) with a thermostat connection. There is a thermostat in the meat walk-in box in the back room. Their trouble is with the display cases for meat and fish. They do not keep cold enough. The walk-in box in the back room is not worked, and being in a cold room, does not require much refrigerant, so the thermostat stops the machine. Hence, the meat and fish case in the warm room warms up the machine. It cannot start because the thermostat has it shut off. The company who installed it said to starve the coils in the walk-in box. That's O.K., but on a cold day, the thermostat still won't let the machine start. When a warm day comes along, there is not enough refrigeration.

I recommended installing a solenoid valve for the walk-in meat box connected to a thermostat, and let the pressure switch take care of the meat and fish cases. What do you say? They do not agree with me.

ANSWER: To properly control the several refrigerated spaces at the various temperatures stated, it will be necessary, in my opinion, to provide separate temperature control for each, and since all the coils are now equipped with thermal expansion valves, the best method of temperature control would be a solenoid valve in the liquid line just ahead of each expansion valve, and controlled by a room type thermostat set for the temperature required.

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This is particularly true of the two walk-in coolers and the milk and butter box which are not subject to such heavy service loads as the two display cases. Let's take each refrigerated space separately and analyze it.

Fish Display Case. This case held at a temperature of 28° to 30° F. is the coldest fixture, and because of its low temperature, will not operate on a defrosting cycle. Therefore, we do not need to provide any control to prevent the accumulation of frost in the coil. The case temperature will be maintained at a below-freezing temperature, and the coil will not be permitted to warm up enough to melt off the frost. The service load on this case may be quite heavy due to the opening and closing of doors. The pressure must be set to cut out at a low enough pressure to take care of the coldest coil in the system, which is the fish case. Therefore, if we set the switch to cut out at about 6 lbs. and cut in at about 24 lbs., we can let the fish case be controlled directly from the pressure switch with no other temperature regulation. However, because this is the coldest coil in the system, it would be a good idea to install a check valve in the suction line of this case, to prevent any migration of refrigerant from the warmer coils which may condense in the cold coil causing it to flood.

Meat Display Case. When held at a temperature of 34° to 36° F., it will be subject to the heaviest service load, and in addition, may be subject to heavy product loads once each day when the case is reloaded. Because this case will probably call for refrigeration more often than any of the other fixtures, I think it, too, can be controlled directly from the pressure switch. However, the pressure switch setting must be low enough to take care of the coldest fixture which would be too low for the meat case. Therefore, we will need an auxiliary control in the suction line to maintain the higher temperature in this case. Furthermore, humidity is an important factor in this display case, and it is desirable to provide a control which will prevent the coil reaching such a low temperature that too much moisture will be removed from the case in the form of ice frozen on the coil. For these reasons, then, a suction pressure regulating valve should be installed in the suction line.

Milk and Butter Box. The service load on this box will very likely be light and temperatures can vary quite widely without damage to the products. Because of lighter load and higher temperature, it should be controlled by solenoid valve in the liquid line and a thermostat. In order to prevent the coil temperature being pulled down too fast while the thermostat is still calling for refrigeration—thus causing too much ice accumulation in the coil, it would be well to provide suction pressure regulation on this fixture also.

Walk-in Coolers. These two coolers are the most important of all the fixtures from the standpoint of temperatures and humidity. The service load on these coolers is very low, but they are both subject to heavy periodic product loads when fresh supplies are loaded into them. At these times, the machine will be required to run for an extended period in order to reduce the heavy heat load imposed by the fresh meats or vegetables. The coils during this long running period will have a tendency to ice up rather heavily because the entire capacity of the machine will most likely be pulling on the walk-in cooler—the other fixtures having been satisfied, and the suction pressure will be lower in the walk-in cooler coil than desired.

If we control each of these coolers by a separate thermostat and solenoid valve, the heavy load period and the probable icing of the coils can be controlled by a suction pressure regulating valve.

To sum up the whole system then, we will have a separate thermostat and solenoid in each of the meat storage cooler, the vegetable storage cooler and in the butter and milk box. The fish case will have a check valve in the suction line and in order to control the suction pressures, we can group the suction lines from all the fixtures with the exception of the fish case on one manifold, and install a suction pressure regulating valve at that point. This valve should be set for the pressure required in the meat cooler and while this will be too low a pressure for the vegetable cooler and the butter box, it will at least keep these coils from reaching such a low temperature that an excess of ice will accumulate. The attached sketch will show the entire layout.

With the present system of control you have, it would be better to disconnect the thermostat from the walk-in cooler and permit the entire system to operate from the pressure control only. It will not be possible, however, to maintain the different temperatures required with this system. Your suggestion of installing a solenoid

valve in the meat cooler, controlled by a separate thermostat and permitting the balance of the system to be controlled from the pressure switch would be an improvement. This would permit fairly good temperature regulation in the meat cooler and one other fixture, but not in all of them.

MULTIPLE SYSTEM ERRATIC

QUESTION 556: I have several problems on commercial refrigeration, and I would appreciate your answer very much.

Problem 1—This is for a beer garden. They have two draft stations with sweet water bath using Uniflow system and T.X.V. —also on this hook-up, they have a bottle box 8x2x2 with T.X.V. and the back bar has an ice maker with a fin coil which is also T.X.V. This hook-up has the two draft stations controlled by a Temprite 2.T.V. set at 20 lbs. B.P. The bottle box and ice maker are controlled by low side cutout, cutting off at 7 lbs. B.P. and cutting back in at 23 lbs. B. pressures. Now my problem is that only one of the draft stations will cool the sweet water bath to 35° or 36°. The other station seems to starve and warms up entirely. I have changed the valves twice and put a dryer ahead of the valve. Each time I change the valve, it seems to work for several hours, or while I am there, and shortly afterwards, it warms up again. Now this station that warms up all the time had ice put in with the water. The unit was turned off Saturday night and started up about 9:30 Sunday forenoon. That gave the draft station which had been working O.K. time to defrost all the ice on the coil and the water warmed up to 40°, but this other station still had plenty of artificial ice in it. After starting the unit, it worked O.K. and formed ice on its coil and had water T. of 36 degrees. The other draft station only works to pull down water T. to barely 39° now. I just called in this morning and both stations are still the same. I have 7½ lbs. gas CH_3CL in the system and I know it is not short of gas. It appears as though the load is unbalanced. Would two new valves in draft stations be better, or would it be better to use a 2.T.V. for each station? Everything else works satisfactorily, except that this 2.T.V. does not operate both draft stations alike. I have not been able to make them work right and I don't know why. I cannot give the sizes of the draft stations, but I would judge they are 3'x3'x1'.

Problem 2—I have a number of apartment houses with Kelvinator WL-40 1 hp. unit, working on 14 to 20 boilers. All of these machines have had seal leaks and other boiler flange leaks—hand valve leaks on both low and high side. Therefore, there must be some uncondensable gas in, although I have stopped the units and bled air off from high side a number of times—compressor pumps down to 22" to 24"V against head pressure.

Now my problem is that the machines never stop or cycle. The receiver is cool all the way up—head pressure from 60 lbs. to 65 lbs.—low side hangs at 10" or 11"V, and there are no frosted lines showing any signs of boiler leaks. I have added gas, have bled high side and have turned off water flow, but I cannot get the receivers to warm up on top like the other jobs that work O.K. Why do all these Kelvinator systems have to be set to pull down to 14"V in order to cool the boxes and freeze ice cubes?

ANSWER: Your problem with the two draft stations sounds to me as though it is one of those cases where the suction lines are tee'd in together close to the two coils and that the feeler bulbs of the thermostatic expansion valves are attached to the suction line somewhere near the tee. If this is the case, it is probable that the temperature from one suction line is holding the expansion valve of the other coil closed. In other words, it is a problem of which coil comes down to temperature first, and which valve shuts off first which will determine which of the coils will continue to operate, and which one will remain off.

Where the thermal bulbs are close together, the cold refrigerant from one coil may back up far enough in the suction line of the other coil to affect the thermal bulb, and thus, close the expansion valve.

GRUNOW RELAY DROPS

QUESTION 557: I have a model 60-SD Grunow refrigerator to repair. If I lift up the plunger of the relay until the motor comes up to speed, and then let go of it, the unit will run O.K. I replaced the transformer, condenser and relay with new ones, and the unit still does the same thing. What is the trouble with the above unit?

ANSWER: It would be my opinion that there is something wrong in the motor winding circuit of the model 60 Grunow you describe. The trouble may be due to poor contacts, or may be due to an open winding

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The Wartime Use and Servicing of Electric Fans

By the Engineering Department
Reynolds Electric Company

AS many walk-in coolers and other commercial refrigerators are equipped with electric fans to provide air circulation, the refrigeration service man is frequently called upon to service these appliances, not only for refrigerators but for use in other parts of the plant. The fan may be noisy, it may be running at less than rated capacity or it may be stopped entirely.

As the manufacture and sales of fans is restricted and subjected to strict governmental regulation and rationing, it is difficult to get new fans for replacement except for a few specified uses. Yet it is important to our war effort that as many as possible be kept running at full efficiency. The War Production Board recognizes this and does permit the manufacture and sale of certain repair and replacement parts under Order L-176 as amended April 6, 1943.

When the engineer is called upon to service a fan, he should check over the possible sources of trouble as follows:

Sources of Trouble

1st. Be sure the cord is plugged in tight.

2nd. Check the terminal connections and electric fuses.

3rd. Check the starting switch. Does it operate on all speeds?

4th. Check motor bearings and if worn, have them replaced.

5th. Be sure the motor is oiled in accordance with the manufacturer's instruction card, unless it has sealed lubrication. More motors require servicing because of neglect of this important factor than any other one thing. When used in a refrigerator, it should be oiled with ice machine oil. If instruction card has been misplaced, write the manufacturer for another copy.

If the fan still fails to operate at normal efficiency, the motor should be returned to the manufacturer for checking and overhauling.

The great shortage of refrigeration service engineers, due to so many joining the armed forces and others doing important war production work, throws a great burden on those who are left in the field. Food is the No. 1 critical material now ahead of ammunition and guns, and much of the task of avoiding disaster because of excessive food spoilage, rests on the refrigeration service men who are still on the job.

Because of the skilled men shortage and the difficulty of getting needed repairs for refrigerators despite high priorities, many walk-in coolers and cold storage rooms cannot get the attention they require. Many are ailing through lack of servicing and to the great misfortune of our country, huge quantities of food will be spoiled during the next few hot months.

Air Circulation

When a walk-in cooler or cold storage room is not operating for various reasons, at its highest efficiency, conditions can often be greatly improved by providing efficient air circulation. The service man will sometimes find that refrigerators which were operating efficiently under normal conditions, even though depending on gravity circulation alone, would develop high back pressures when crowded with stored products. This trouble can then be overcome only by installing the proper type of air circulator.

Considerable research has been made during the past five years on the subject of air circulation in refrigerators and valuable scientific data has been accumulated. Because a fan blows air does not mean it will produce adequate air circulation in a cooler. Many experiments have demonstrated that it must be able to circulate a comparatively large volume of air with gentle motion. It must blow in the proper direction in order to move the air in all parts of the cooler and break up "dead air" spaces.

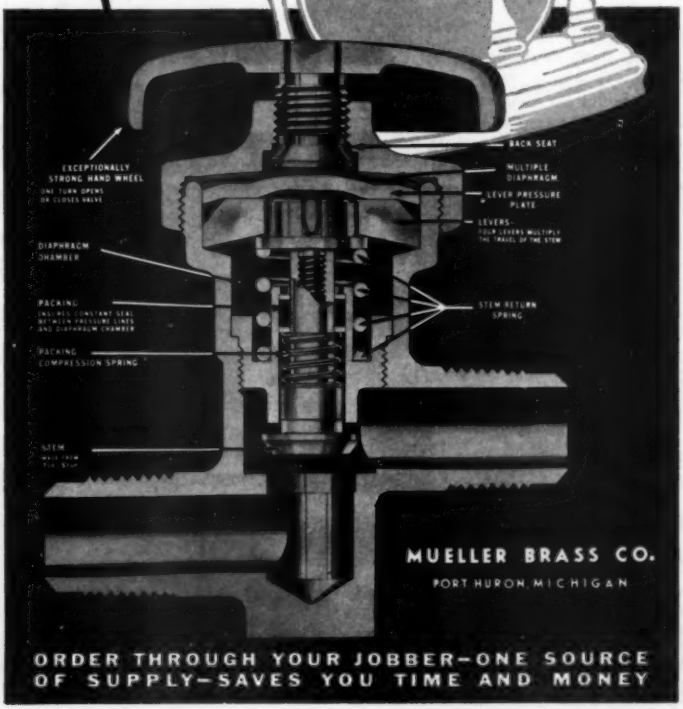
One of the most effective means of supplying this vital need is a fan of simple

Increased DIAPHRAGM LIFE PROLONGS THE SERVICE LIFE OF THE VALVE

● Because of the small amount of movement, the multiple diaphragm in our Triple Seal Valve is never deflected past its normal center, thus immeasurably prolonging both its life and the life of the valve in service.

This valve has positive sealing at three essential points—a back seat with valve in open position—the multiple diaphragms—and the superior packing around the stem. This packing assures constant seal between pressure lines and diaphragm chambers.

One turn only completely opens or closes the valve.



MUELLER BRASS CO.
PORT HURON, MICHIGAN

ORDER THROUGH YOUR JOBBER—ONE SOURCE OF SUPPLY—SAVES YOU TIME AND MONEY

capacity that blows upwards similar to that shown in Fig. 1. After being forced up the air travels along the ceiling, down the walls and up the center again as per Fig. 2, completely moving all of the air in the room, in and around the coils, stored products, etc. This produces uniform temperature throughout the room. This super-cold air around the coils is intermixed with all of the air in the room.

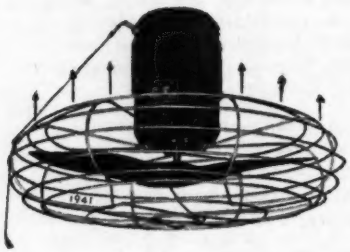


Fig. 1—Reco Refrigerator Fan for mounting on ceiling.

Such efficient air circulation accomplishes results that are almost startling in the walk-in cooler that is ailing. It prevents formation of ice on coils, it dries up wet ceilings and walls, it restricts mold formation, it dissipates odors, reduces operating costs and avoids food spoilage.

All refrigerating engineers recognize the importance of complete air circulation in a cooler and today, when the efficiency of many refrigerating systems is decreasing

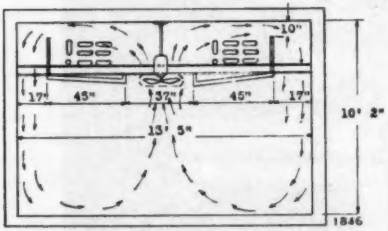


Fig. 2—Sectional view of a refrigerator with Reco refrigerator fan installed, showing the movement of the air. It is forced upwards by the fan, traveling along the ceiling, down the walls and up the center again, passing over the coils and in and around all stored products.

and coolers are often overloaded, adequate air circulation is more important than ever.

If a customer complains about high back pressures caused by ice on coils, hence overloading the compressor and causing other troubles previously mentioned, and you do not have time to give personal attention to the matter, you can often help the customer and the country's food supply by recommending the installation of an efficient air circulator.

At the present time, manufacturers of motor driven circulating fans require a priority of AA-5 or better and must secure permission to install them from the War Production Board on form PD-556. The Board usually grants permission for fans in walk-in coolers, as they realize full well the highly critical food situation and are anxious to reduce food spoilage as much as possible.

S S S

IRONING OUT THE BUGS

(Continued from page 28)

out. Too many refrigeration service firms are semi-hidden in dingy old buildings which mean nothing to the passerby. We believe in showmanship and lots of it."

Finally, Mr. Renaud has beaten the "bug" of conflicting appointments and jammed work schedules by setting up a strict assignment sheet as carefully worked out as a doctor's appointment list. No repair job is accepted until this list is checked, and none are scheduled unless enough "time lag" or clearance between it and the next can be allowed to prevent disappointing one customer while finishing up another's work.

"We schedule all the work we can handle and no more," Mr. Renaud said. "Sometimes this may mean making appointments two or three weeks in the future, but we stick to our guns. Naturally we lose a few customers in this way, but the important thing is that we don't dissatisfy anyone."

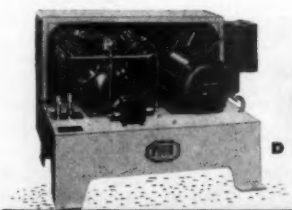
S S S

James N. Anderson,
Auckland, New Zealand

"I do not want to miss any copies of the most interesting and instructive journal published on refrigeration."

"Take Advantage of PAR'S Exchange Policy!"

So that PAR condensing units now in service can maintain their same high efficiency and economical, dependable service, offer your customers PAR'S exchange service of valve plates and compressor bodies. Badly worn or unserviceable units may be exchanged for units which carry the same rigid tolerances as the original equipment, for a fraction of their original cost. You will not only help to keep their equipment in tip-top condition but will promote good-will and confidence for yourself. Write for complete details of PAR'S exchange policy.



PAR
DIVISION

Manufacturers of
PAR Commercial Refrigeration Units

LYNCH MANUFACTURING CORPORATION · DEFIANCE, OHIO, U. S. A.

Refrigeration Helps Defeat the U-Boat

BEFORE the war, the people of Britain, unlike the Americans, were not refrigeration-minded, and though there existed a cold storage capacity of 30 million cubic feet for housing overseas cargoes, this figure is actually less than the capacity in 1918.

Immediately upon the outbreak of war, the British Government, through the Ministry of Food, took control of all cold storage plants in excess of 2,000 cubic feet and taking to heart the serious need for additional cold storage accommodation embarked on a bold policy of expansion.

Most of the existing cold storage plants were situated near the ports, London having the major share. It was realized at the outset that for reasons of security new storage accommodation should be built in less vulnerable areas and numerous depots having a capacity of 1½ million cubic feet were erected. The Ministry of Work and Buildings, realizing that such huge buildings offered tempting targets to enemy bombers, later built stores with capacities of a half million cubic feet and has finally standardized cold storage plants with a capacity of a quarter of a million cubic feet.

Modern Ideas Used

These new stores comprise six chambers on three floors, are a first-class engineering job and embody all the latest ideas both from a structural as well as from the purely engineering point of view. An interesting feature is the duplication of the engine-room which insures that at least a part of the store could function, even though one of the engine rooms happened to be destroyed by enemy action.

The refrigerating compressors are intended to hold the temperature at 14° F., but ample power is provided, capable if needed, of taking the temperature down to 0° F. Ammonia is used as the refrigerant with shell and tube-type brine coolers. Independent air coolers are fitted, each having its own fan.

In the latest plants the "envelope" system of cork insulation has been adopted. This comprises a complete covering of cork surrounding the internal steel-framed building and constructed independently of the external walls. This arrangement is simpler and cheaper than the cellular system in which each floor and each storage chamber are separately insulated. Owing to the fact that the goods belonging to different owners must be stored separately, the space occupied in peace-time by, say a ton of produce, is high but as in war-time the Government owns the principal foods there is a great economy in space.

The latest development consists of shipping frozen deboned quarters of beef from South America. This system provides the most compact meat cargo and has the very important advantage of saving shipping space, which is even more important than storage space in England. To show what this means it may be pointed out that in peace time chilled meat required a shipping space of 110 cubic feet per ton, or 93 cubic feet per ton for frozen meat, whereas frozen boneless beef only requires about 62 cubic feet per ton, including dunnage. In other words, the same vessel which in peace-time could accommodate 8,000 tons of chilled meat can now transport 4,700 tons of frozen boneless beef.

It is interesting to consider the future for all these huge cold storage plants after the war. The solidarity of their construction makes it unthinkable that they should be dismantled, and quite apart from their use as permanent reserve stores, might they not be utilized for the storage of many other classes of food stuffs including fruits and vegetables?

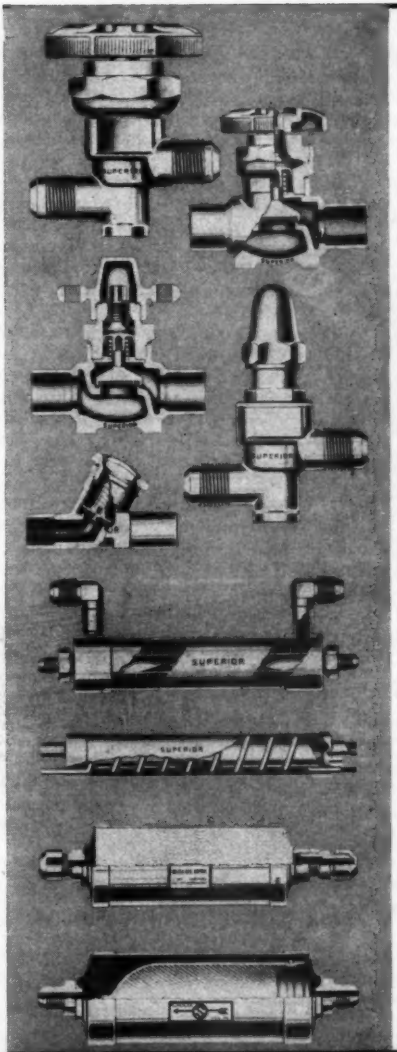
✕ ✕ ✕

THE QUESTION BOX

(Continued from page 35)

itself. It would seem that since you have replaced the relay that the contacts there should be O.K.

A poor connection, or a poor contact in the wiring to the motor winding may be causing the trouble. It should be possible to trace this trouble through the use of a test lamp.



Superior PRODUCTS *for Your Essential* WARTIME NEEDS

- ★ **DIAPHRAGM PACKLESS VALVES** — Two-way and globe — ¼" to ⅝" flare; ¼" to ⅞" sweat; ½" and ¾" F.P.T.
- ★ **PRESSURE CUP GLOBE VALVES** — ⅞" to 2⅛" sweat; ¾" to 2" F.P.T.
- ★ **PACKED VALVES, BACK-SEATING** — Hex. seal cap. Flare and sweat to ⅝"
- ★ **CHECK VALVES**—Positive; noiseless. ⅜" to ⅝" flare; ⅜" to ⅞" sweat.
- ★ **LIQUID INDICATORS** — With seal cap. ¼" to ⅜" flare; ½" to 1⅜" sweat.
- ★ **DEHYDRATORS** — Refillable; 6 to 60 cubic inches.
- ★ **FILTERS** — 1 to 5 HP.; ¼" to ⅝" flare.
- ★ **HEAT EXCHANGERS** — 4200 to 36,000 BTU capacity.

See your Jobber, or write for copy of Catalog R-2

No. 84

SUPERIOR VALVE & FITTINGS CO.

★ 1509 WEST LIBERTY AVENUE ★

PITTSBURGH ★ PENNSYLVANIA

MERCHANT MARINE NEEDS MEN

THE recruiting of skilled personnel to man the huge and ever-increasing Merchant Fleet of the country is pointed out by the War Shipping Administration at Washington as one of the Nation's most vital problems. It is expected that by the end of 1943, 2300 newly delivered vessels will be flying the flag of the United States.

The greatest need is for men with sea experience of certain skills, such as mates, engineers, able seamen, cooks, bakers and qualified members of the engine department.

As one example of what has been accomplished by the Merchant Marine, the invasion of North Africa last October involved 500 merchant ships carrying the supplies needed. to make that invasion successful.

Those men who are qualified may get in touch with their local office of the Recruiting and Manning Organization of the War Shipping Administration, local office of the United States Employment Service, with the War Shipping Administration in Washington, or with their affiliated Maritime Union Hiring Hall.

S S S

REFRIGERATOR BRINGS HIGH PRICE AT AUCTION

BIDDING was slow at the auction to settle the estate of Vaughn De Leath, "first lady of radio" who lived in Easton, Conn., until the electrical refrigerator came to the block.

Then housewives stymied by war restrictions on making new refrigerators excitedly bid up the price to $1,130, for a refrigerator with a ceiling price of $69.

Mrs. William T. Rock got it at $1,130, of which $69 went to the estate and the rest into war bonds and stamps. The news report did not state who got the war bonds and stamps.

S S S

AMATEUR REFRIGERATOR REPAIR MAN ELECTROCUTED

WHILE repairing a refrigerator in his home, Alois S. Simet, Buffalo, N. Y. was electrocuted. Police reported that he had neglected to pull the plug before starting to work on the refrigerator's electrical system. He received a shock when he touched a bare wire.

TEACHING BY PICTURES TO SPREAD AFTER WAR

THE picturization of mechanical devices in instruction books and servicing manuals will expand to many industries immediately after the war, according to Assen Jordanoff, author and president of Jordanoff Aviation Corporation.

"The success of visual instruction and explanation in service manuals in aircraft used by the armed forces has been phenomenal," Mr. Jordanoff said. "When we turn to peace time activities we will take the picture and short caption instruction books with us.

"Visual instruction, now so successful in aviation, will be utilized by hundreds of industries after the war," said Mr. Jordanoff. "In the post-war years the value of training personnel by means of carefully devised illustrations will be fully appreciated. For example, such instruction will be ideal for automotive repairmen, or operators of precision machinery. A series of illustrations, completely outlining the necessary steps in repairing a refrigerator will enable the service men to make repairs in half the time required to read complicated, all-word explanations or decipher blue prints."

Jordanoff Aviation Corporation has several hundred artists and illustrators working on manuals at present. The instruction manuals, prepared by the Jordanoff Aviation Corporation, are widely used in aircraft factories, and by American Air Forces and those of the Allies. By means of graphic illustrations and appropriate text, the manuals give ground crew members and mechanics instruction in repair work, pictures showing each part accurately.

S S S

AIR CONDITIONING BUILDS BUSINESS

(Continued from page 30)

that will bring in more business to add to the current gross profit with the present margin. This test may well be used by every retailer when he finds that the competition for his dollar is getting warmer. He will be quoted cost readily. The estimate of values must be suggested by the merchant himself. But Mr. and Mrs. Public will shape the decision, and it will be a favorable one, if their comfort is considered.

THE STANDARD OF *Enduring Craftsmanship*

In the days of Charles Bulfinch, great American Architect.

Charles Bulfinch, one of America's earliest professional architects, helped span the centuries between the highly specialized profession of today and the great builders of previous ages when artist, craftsman and architect were more nearly one. Bulfinch designed the Massachusetts State House, 1798, and was the Architect of the National Capitol, succeeding Latrobe. Drawing on the great Renaissance architects for inspiration, his works were emblems of sincerity, simplicity and refinement.

Sincerity in one's efforts to make his product excellent —Simplicity applied to its ultimate use—Refinement in every process of manufacture— consistently followed, these rules are bound to make a product worth buying.

"EXTRA DRY ESOTOO", "V-METH-L" AND METHYLENE CHLORIDE

"VIRGINIA" REFRIGERANTS

AGENTS FOR KINETIC'S "FREON-12"

VIRGINIA SMELTING CO.

WEST NORFOLK, VIRGINIA

New Chairman Pushes Membership Drive
113 New Applications Received

PRESIDENT E. A. PLESSKOTT of the Refrigeration Service Engineers Society has appointed Willis Stafford Assistant Chief Instructor, Commercial Trades Institute, Bloomington, Illinois, to succeed S. B. Garland, North Attleboro, Massachusetts as Chairman of the Membership Committee in charge of the present International Membership Drive.

WILLIS STAFFORD, Bloomington, Ill. New Chairman of the Membership Committee

Mr. Stafford spent some time on August 1 in making arrangements for pushing the membership drive with renewed vigor. He is formulating detailed plans for new chapters and members in all of the nine Regions into which Canada and the United States have been divided for the purposes of the drive.

New Memberships

During July, in a deluge of new memberships which came following the opening of the membership campaign on the first day of the month, 113 new applications were received. Warren Farr, Chairman of Region 4 who is located in Cleveland, O., won first honors by turning in the highest number of new memberships from his territory which includes Ohio, Michigan and Indiana. The high point in his endeavors was reached at Youngstown, Ohio, where the chapter took on a sudden burst of activity resulting in 41 new members. More are in sight. Some of these prospective members were expected to turn in applications at a meeting arranged in Youngstown for the night of August 3. Mr. Farr attended the meeting and addressed the revived chapter.

W. W. FARR, Cleveland, Ohio. Chairman, Region 4, who made best showing in July

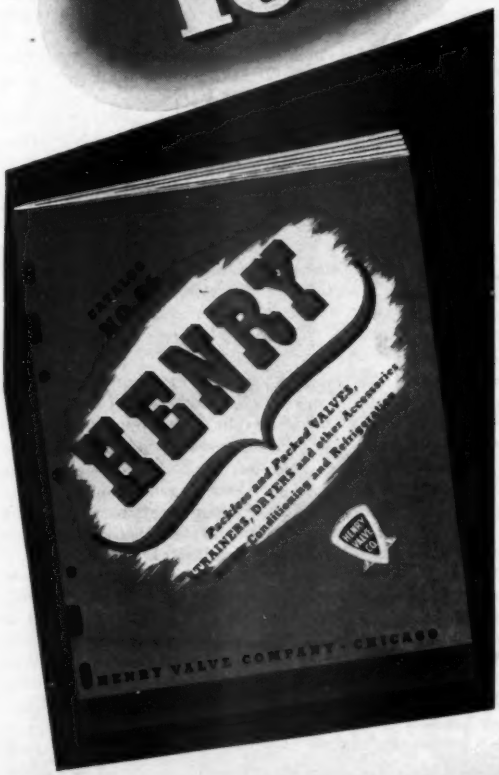
Mr. Farr, who is going through his territory with a finetooth comb plans to revive the chapter at Detroit which has been inactive for some time. K. P. Wall, a former member of the Cleveland Chapter, but now in Cincinnati will undertake the formation of a chapter in the latter city, under Mr. Farr's supervision. Akron, Ohio is a prospect, and so is Terre Haute, Indiana. Mr. Farr, by hard and intelligent

Book of the Year

for

REFRIGERATION AND AIR CONDITIONING MEN

YOUR COPY IS READY NOW!


HENRY
Packless and Packed VALVES, STRAINERS, DRYERS and other Accessories for Refrigerating, Air Conditioning and Refrigeration
HENRY VALVE COMPANY · CHICAGO

Just off the press, the new Henry Catalog No. 96 gives you a complete answer to that all-important question: "What equipment will be available for the duration under Schedule IV of the government's order L-126?" Twelve illustrated pages give you all the answers and full information on Henry Packless and Packed Valves, Strainers, Dryers and other accessories for low pressure refrigerants. Types, sizes, capacities and dimensions are clearly shown. You'll agree when you see it that this new Henry Catalog No. 96 is truly refrigeration's "book of the year." It's yours for the asking. Address your request today to

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letter work, has succeeded in arousing high interest throughout Region 4.

C. Buschkopf, Beaver Dam, Wisconsin, First Vice-President of RSES, who is chairman of Region 6, including Illinois, Iowa, Wisconsin, Missouri and Minnesota, was the runner-up to Mr. Farr. He had strong support from Willis Stafford, new Chairman of the Membership Committee who played a key part in the formation of the new Corn Belt Chapter at Bloomington, Illinois. This new chapter was authorized on July 15, and starts with 40 members. Mr. Buschkopf also visited Minneapolis during the month, and was active in urging on the efforts of the Twin Cities Chapter, which expects to make a notable contribution to the membership drive during the next thirty days.

Claude Brunton, Huntington, W. Va., who is Chairman of Region 3, has made arrangements for the final step in the formation of the proposed new chapter at Raleigh, North Carolina. R. W. Lampie, Secretary of Virginia Chapter No. 1, at Richmond, will go to Raleigh in the near future to address a meeting of service men in Raleigh and vicinity, which is being arranged by C. V. Hale, member-at-large in Norfolk, Va.

Letter to Service Men

In Denver, Colorado, R. C. Kimmel, who is Secretary of the strong Mile High Chapter and Chairman of Region 8 in the membership drive, is sending a powerful letter and a copy of the current REFRIGERATION SERVICE ENGINEER to all service men who are not already members within the confines of his far-flung territory, which includes Colorado, Montana, Wyoming and New Mexico. With each letter will be enclosed an application blank. The mechanical part of this approach is being handled at the International Office.

J. L. Driskell who is chairman of Region 9, including the important Pacific Coast territory, writes from Burley, Idaho, that although he is working from 8:00 A. M. to 11:00 P. M. every day, he is also making ambitious plans for securing the maximum number of new memberships from Region 9. He is working at the moment on the formation of a Utah Chapter, which it now seems will be a single chapter for the whole state, with meeting places rotated among Salt Lake City, Ogden, Provo and Richfield. Like Mr. Kimmel, Mr. Driskell is launching a letter campaign directed at non-member service men within Region 9.

C. J. Doyle, Omaha, Nebraska, genial Treasurer of RSES, who is Chairman of Region 7, has reported that he is getting under way with the solicitation of memberships in his territory, which includes Nebraska, Kansas, North Dakota and South Dakota. Clem's territory is a little shy on fair-sized cities, which lend themselves to the formation of new chapters, but he writes that before the campaign is finished every non-member service man in the four states will be approached, which, he thinks, will guarantee first class results from Region 7.

William Marshall, Leaside, Ontario, who is Chairman of Region 1, which includes all of Canada, writes that he is making progress in plans for effectively covering his vast territory. George Tindall, Treasurer of the Ontario Maple Leaf Chapter, persuaded the membership of that chapter to vote, at a recent meeting, a prize of $10 from the chapter funds to the member who turns in the most applications.

John K. Bush, Lockport, N. Y., Chairman of Region 2, and E. A. Summer, Baton Rouge, Louisiana, Chairman of Region 5, eastern and southern territories, respectively, have not reported, but it seems likely that the reason for this is that they are too busy with the work of membership solicitation now, and that the good results from their territories will figure in the later news.

S S S

JOBBERS HELP SERVICE MEN

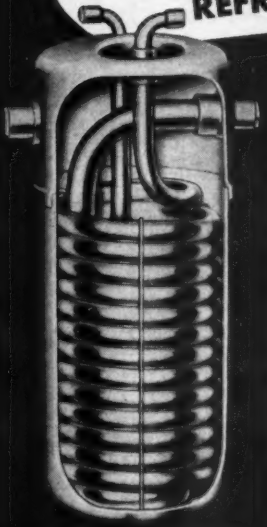
ACCORDING to J. F. Wickham, Secretary and Treasurer of the Midwest Refrigeration Supply Jobbers Association, the members of that organization have embarked on an enlarged program of giving engineering help and technical information to service men and dealers.

Mr. Wickham, who is head of the Wickham Supply Co., 1512 N St., Lincoln, Nebraska, declares that this kind of help is appreciated in these days of priorities, ceiling prices and puzzling regulations. In all cases the jobbers belonging to his organization are well posted and are more than glad to render all possible cooperation.

The Midwest Refrigeration Suppy Jobbers Association is composed of leading jobbers in Minnesota, Iowa, Missouri, Oklahome, Kansas, Nebraska, South Dakota and Colorado.

Temprite ACCUMULATOR-INTERCHANGER

Improves OPERATION OF LOW TEMPERATURE REFRIGERATION EQUIPMENT



The Temprite accumulator-interchanger is of rugged all-steel construction, hermetically fabricated by means of the copper hydrogen furnace weld which assures positive gas tight joints and absolute freedom from scale.

THE Temprite accumulator-interchanger is designed to improve the operation of low temperature refrigeration equipment by:

❶ Permitting one hundred per cent of the evaporator coil surface to become effective because it eliminates any necessity for using a part of this coil as a drying agent for the refrigerant:

❷ By eliminating return of liquid refrigerant to the compressor crankcase and:

❸ By preventing formation of flash gas in the evaporator coil.

The Temprite accumulator-interchanger is a newly designed liquid and suction line heat exchanger incorporating the accumulator principle which traps any liquid refrigerant that may spill over from the evaporator. The accumulator then holds the liquid refrigerant until the liquid line heat can evaporate it thus insuring dry gas being returned to the compressor at all times.

When this highly efficient unit is installed on any low pressure refrigeration system it permits lower temperatures to be obtained, avoids possibilities of compressor trouble and reduces operating costs.

★ *Applications* ★

Low Temperature Food Storage • Quick Freezing Applications
Low Temperature Industrial Coolers • Rivet Coolers • Steel Aging Cabinets

Dealers

Write our sales department today for complete specifications on this Temprite accumulator-interchanger unit. Prompt deliveries are assured on all orders carrying necessary priorities.

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous *Liquid Cooling Devices*

45 PIQUETTE AVENUE • • • DETROIT, MICHIGAN

SELECTIVE SERVICE DIRECTOR TAKES ACTION ON DEFERRING REFRIGERATION SERVICE MEN

THROUGH the effort of the International Office of the Refrigeration Service Engineers Society, Major General Lewis B. Hershey, Director of Selective Service, has sent a wire to all state directors recommending that local boards shall give "most serious consideration to the deferment or postponement of induction of refrigeration repairmen until October 1, 1943."

The International Office secured this action, promising temporary relief for the ranks of refrigeration service by working through Arthur D. Whiteside, Vice Chairman for Civilian Requirements of the War Production Board.

"With nearly 50 per cent of our members already in military service or working in war production plants," Mr. Whiteside was informed, "we find that we shall be unable, if any more of our manpower is taken, to keep the mechanical refrigeration facilities of the nation in efficient operation this summer. We are addressing you, therefore, to put before you a formal request for a temporary deferment of four months from July 1, 1943 for all men of military age, subject to the draft, who are engaged in refrigeration service."

The International Office of RSES also furnished complete detailed statistics relating to the situation.

On July 24 Mr. Whiteside wrote: ". . . covering the manpower situation, I have had very good news from Selective Service. You will find local draft boards more understanding in the future."

Impetus was given to favorable action on the plan proposed by the Society through a presentation by Warren W. Farr, Cleveland, O., member of the Board of Directors. Mr. Farr went to Washington to describe conditions in Cleveland as a typical American city before a number of officials, including Mr. Whiteside and other high members of the War Production Board and the War Manpower Commission.

Through the present International Membership Drive and the program of the Wartime Educational Committee, headed by Paul B. Reed, Servel, Inc., RSES plans to bring new men into the organization and to train them as rapidly as possible. Thus it is hoped to furnish replacements for service men who will be drafted following the "go easy" period ending October 1.

The above picture, refrigeration service men will recognize, is of Harold T. McDermott, Secretary RSES and Advertising Manager, Nickerson & Collins Co., publishers of THE REFRIGERATION SERVICE ENGINEER, now Staff Sergeant, 25th Evacuation Hospital, U. S. Army, on duty overseas. Sgt. McDermott left Chicago with his outfit last August and, after preliminary training, embarked some months later.

The first duty of the Unit was constructing and equipping an army hospital. Although conditions there are quite primitive and there's little time for leisure, "Mac" reports that he is feeling fine and enjoying the best of health.

S S S

YOUNGSTOWN CHAPTER RALLY

PRINCIPAL speaker at a rally of the Youngstown (Ohio) Chapter of the Refrigeration Service Engineers Society was Ralph C. Cameron, Regional Sales Supervisor of the Airtemp Division, Chrysler Corporation, Dayton, Ohio.

Mr. Cameron spoke on "The Post War Possibilities of the Refrigeration Industry," stressing particularly those phases of interest to service men. Warren W. Farr, who came over from Cleveland, addressed the meeting on the accomplishments of RSES. J. Dallas Nutt, Secretary of the Youngstown Chapter, read a letter of congratulations written by Acting Secretary J. W. Power for the officers and directors of RSES, the occasion being the leading position of the chapter for July in the International Membership Drive.

WANTED

YOUR POST-WAR PROBLEMS

Here is an opportunity to work direct with a leading refrigeration manufacturer and their staff of engineers in designing your post war refrigeration units. The possibilities are limitless in developing greatly improved products, particularly along the lines of domestic refrigeration, frozen food handling and sub-zero industrial applications. A great variety of new materials, processes, advanced technical and engineering skills, born of the war, are at our command to aid you in your post war thinking.

We solicit inquiries on your post war problems as well as your present essential requirements and offer our engineering facilities in working them out.

Address all inquiries to

TECUMSEH PRODUCTS COMPANY

Tecumseh • Michigan

To the 41 new members secured in July, 10 more applications were taken at the meeting, which was followed by a banquet. Eighty were present. Ed Wright acted as program chairman, and did a capable job.

Mr. Farr, who is a member of the Board of Directors of RSES and Chairman of Region 4 in the International Membership Drive, said: "The members of the Youngstown chapter are certainly pulling together, not only for the membership campaign, but to make their chapter a bang-up affair, which will serve their needs in the future."

S S S

CLEVELAND CHAPTER R.S.E.S.

HERE'S from a Member in the South Pacific. In keeping with the policy of most of the Chapters, Cleveland Chapter has made a practice of maintaining the membership of those members now serving in the armed forces. One such member was W. Hipkins, C.E.M., who is now with the Navy in the South Pacific. Recently, Mr. Hipkins wrote the Chapter a rather interesting letter, excerpts of which follow:

"Just received your Xmas greetings and the paid up card to the Society. I wish to offer my thanks for same and will try my best to give you a little information which I hope will pass the censor, as per your request. I am on an island in the Southwest Pacific and nearly all of our refrigeration equipment has been captured from the Japs, and it certainly is far behind our models at home. Things were very active here for the first five or six weeks, but the last couple of weeks have been very quiet. Nearly everything we use here has been taken from the Japs and surely shows how much more superior our products are in the good old U. S. A. From all I have seen, I truly believe we will win this war, but it will take time and lots of backing from you boys on the home front. Will always have a warm spot in my heart for U. S. Marines, even if us Navy boys are supposed, by tradition, to dislike them. I hope to be with you one of these days."

S S S

ILLINOIS ANNUAL MEETING

THE annual meeting of the Illinois Association, RSES, has been set for Sunday, October 17, in the Nelson Hotel, Rockford. R. C. McCarthy of the Rockford Chapter has been made program chairman. Herman Goldberg, Chicago, will be the main speaker.

R.S.E.S. Chapter Notes

NOVA SCOTIA CHAPTER

July 5—This was the last meeting of the season for the Chapter, inasmuch as the hot summer months would keep the men so busily occupied as to preclude the possibility of good attendance at the meetings. It was announced that the next meeting would be held about the end of September. Officers appointed to serve during this period are: *President,* W. L. Mullenger; *First Vice-President,* H. E. Kearns; *Second Vice-President,* C. J. Tredwell; *Educational,* E. A. Bowes; *Sergeant-at-Arms,* F. A. Herman.

A vote of thanks was given to Mr. Batho of the Manning Equipment Co. for the fine work he did in making the initial meeting of the Chapter such a success. The meeting was held at the home of C. Tredwell, and a late lunch was served following the meeting.

MOTOR CITY CHAPTER

June 8—The annual election of officers was held on this date, and those elected are as follows: *President,* Dave Fortune; *Vice-President,* Owen Dobbs; *Secretary,* Lester Gettler; *Treasurer,* Clare Babcock; *Sergeant-at-Arms,* Gordon Smith.

TWIN CITIES CHAPTER

July 6—The meeting was held at the Andrews Hotel. During the course of the business session, Mr. Palen suggested the appointment of a committee to make a survey of refrigeration service engineers in the area in order to determine how many are now in the armed forces, or working in defense plants. It was felt that this information would help the Chapter in obtaining deferments for their men. The suggestion was well taken and formally passed as a motion.

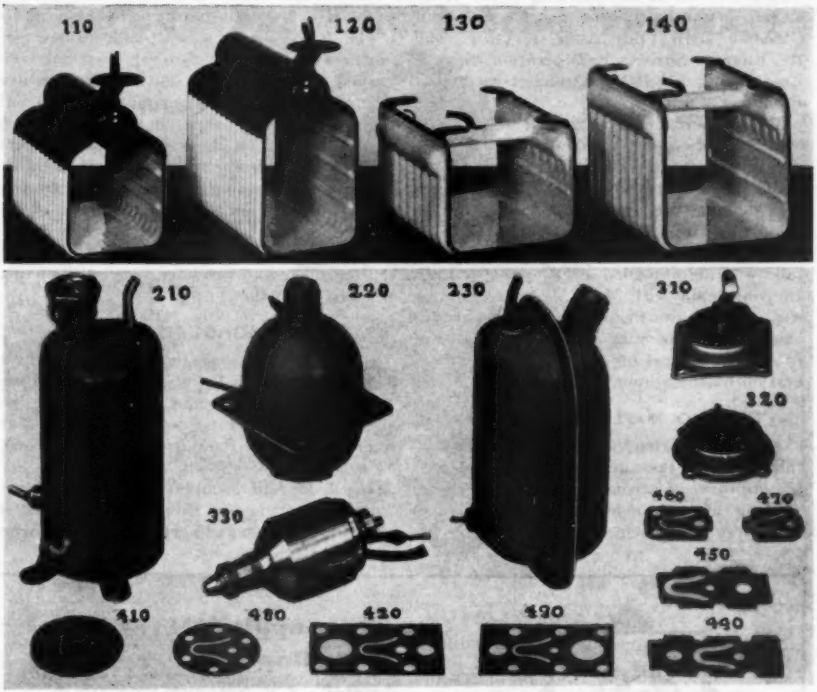
Joe Parupski reported on the use of Freon as a carrier for an insect spray, used by the armed forces, explaining that this use for the refrigerant contributed to its present scarcity. Some discussion arose on the forthcoming picnic and $60.00 was appropriated for expenditure by the committee.

LOS ANGELES CHAPTER

June 30—The meeting as usual, was preceded by a dinner which started off with a pledge of allegiance to the Flag, led by Mr. McQuay. Organization of the defense stamp sale for the attendance drawing got

FOR SALE! —WHILE THEY LAST—

Used Evaporators and High Side Floats



EVAPORATORS—FLOODED TYPE—LIKE NEW

Black, white and combination. On No. 110 and No. 120 leakproof lines $2.50 extra.

110—Two Tray Goose Neck.....
120—Three Tray Goose Neck.....
130—8½" w. 7½" h. 11½" d. Mounting holes 6" across front; 8" front to back
140—8½" w. 9½" h. 11½" d. .....

$6.75

HIGH SIDE FLOATS—FIRST CLASS CONDITION

210—Used on Westinghouse Units.....
220—Ball Type .....
230—Can be mounted in back of refrigerators.....

$3.25

USED GENUINE *WESTINGHOUSE* PARTS IN GOOD CONDITION

310—Circuit Breaker ..... @.75
320—Circuit Breaker ..... @.75
330—*Unloader Valve in Good Condition and Tested*..... $2.50
410—*Discharge Valve Plate*..... $1.10
420—430—440—450—Valves ..... @.50
460—470—480—Valves ..... @.35

Prices F. O. B. Chicago, Ill.

ACME REFRIGERATION PARTS CO.

5217 W. Madison St. **Telephone Columbus 4141** **Chicago, Ill.**

under way, immediately after which the meeting was called to order by President W. C. Irving. New applicants for membership presented at this meeting were: Richard F. Gamache, Gibson Service Co., 1801 Glendale Blvd., Los Angeles, Calif., and R. Eugene Shrive, Refrigeration Service Engineering Co., 122 E. Orange Grove Ave., Pasadena, Calif.

Mr. Herbert, of the City Juvenile Department, was the guest speaker of the evening, providing an interesting talk on child delinquency, during which he explained how the Juvenile Department attempts to develop these boys into better men by encouraging them to use their own initiative. His talk was accompanied by motion pictures. In connection with this talk, a committee was formed by the Chapter to visit the camps, and determine whether it is possible to employ several of the boys in the refrigeration business upon their release.

ONTARIO MAPLE LEAF CHAPTER

June 20—During the business portion of this meeting, arrangements were made for the approval of accounts at the first general meeting of each month. The membership drive was also given a good deal of discussion, and it was decided to offer a prize to the member bringing in the most new members during the year. $10.00 was decided upon as a suitable prize, and was formally approved by the Chapter.

H. B. Nye gave a short talk on new priorities regulations. Several questions were asked, and some discussion arose on the new order. Mr. Nye also announced that a bulletin was being prepared by the Interprovincial Assn., on these priority regulations.

An Honor Roll has been prepared by the Chapter containing the names of twenty-four members and former members of the Chapter. Of these, eleven are now in the Air Force, eight are in the Army, three are in the Navy and two have received their discharge from the Army.

MASSACHUSETTS CHAPTER

June 23—This was the annual meeting of the Chapter with the annual election of officers occupying the main part of the evening. Those elected were: *President*, Harold Warner; *First Vice-President*, Joseph Slattery; *Second Vice-President*, Joseph Foley; *Secretary*, Harold Lambert; *Treasurer*, James Bertram; *Chairman Educational Committee*, Harold Warner; *Sergeant-at-Arms*, Bruce

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Iowa Radio Corporation
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Cedar Rapids, Iowa

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McCombs Refrig. Sup. Co.
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National Refrig. Parts
510 Water St.
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Refrigeration Equipm't Co.
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Kansas City, Mo.

Refrigeration and Industrial Supply Co.
422 So. 7th St.
Minneapolis, Minn.

Republic Electric Co.
East 1st St.
Davenport, Iowa

Ruegg Refrigeration Sup.
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Omaha, Nebr.

Vincent Brass & Copper
100 No. 2nd St.
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A RECORD BREAKING SPECIAL PURCHASE

35 CUBES
11⅛" LONG
7" WIDE
1 1/16" DEEP

A TREMENDOUS VALUE

We have a very large supply of these fine aluminum trays purchased from a nationally known refrigerator manufacturer. A popular size that will fit most any refrigerator.

In Lots of 12, Each $1.15

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No Priority Needed

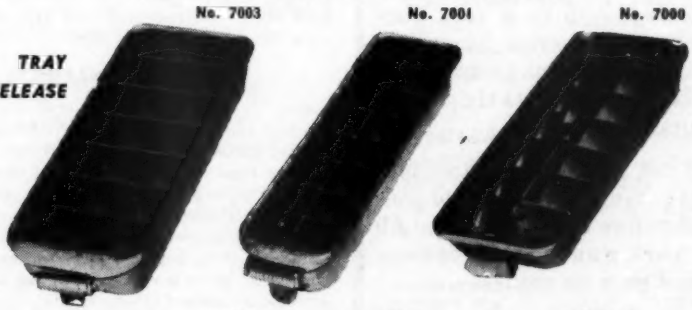
ORDER NOW

SPEED-EX CUBE TRAYS

Heavy aluminum tray 11 1/16" long, 4 9/32" wide, 1 47/64" deep. 14 large cubes. A real buy at our low price while they last.

Lots of 6, Each $1.50

OTHER OUTSTANDING TRAY VALUES



No.	Size	No. Cubes	Steel	In Lots of	
7001	11⅛"x2⅞"x1 11/16"	16	Galvanized, Satin Finish	12	73c ea.
7003	11⅛"x4"x1 11/16"	21	Galvanized, Satin Finish	12	79c ea.
7000	11"x3¾"x1¾"	14	Grey Enamel Finish	12	73c ea.

G & E EQUIPMENT SUPPLY CO., 400 N. Sangamon St., Chicago, Ill.

Write for Latest Catalog. All Prices Net Cash, F.O.B. Our Warehouse

KEY to Our SERVICE

Is Our Long Experience and Careful Attention to your orders for

REFRIGERATION

AND AIR CONDITIONING SUPPLIES AND EQUIPMENT

Write for our big catalog, on your letterhead

The HARRY ALTER Co.

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CONTROL REPAIR SERVICE

Because of the shortage of materials, 1943 will be a very busy one for the Service Engineers. Fewer replacement parts will be available, necessitating more repairs.

Why not send your control jobs to us? We recondition controls equal to new at a small cost. All our work guaranteed for one year. Prices on request.

UNITED SPEEDOMETER REPAIR CO., INC.

342 West 70th Street

New York City

Orton; *Directors,* Harold Ouimet, Arthur Hebert and James Vye.

While the meetings of the Chapter are curtailed to some extent, due to the many members who are now in the armed services, or employed elsewhere in defense plants, there is a great deal more interest shown in the meetings, and the activities are increasing steadily.

An incentive to better programs was offered in the form of a $10.00 prize for the best entertainment provided during a meeting for the coming year. Individual members are planning now for their contribution.

MILE HIGH CHAPTER

July 12—A report on the annual picnic by Ernie Martin and Harold McCombs and the following discussion, developed the consensus of opinion that this year's picnic was more fun and more convenient to the members than any held in previous years. Thus, it took gasoline and tire shortages to convince the members that there is just as much fun to be had near home as in more distant locations.

A motion was presented and duly carried to have refreshments at every meeting. Volunteers were asked to furnish these refreshments, but where they were not provided by volunteers, the treasury would stand the expense. A new educational program was to be tried in which the Secretary will notify three members in advance that they are to furnish the educational program for the next meeting. The Secretary will call on the members in alphabetical order. The member will then select any topic he chooses to discuss. Refreshments for this meeting were furnished by Ernie Martin.

WORCESTER CHAPTER

July 20—The Chapter held its July meeting as scheduled to foster the aims and ends of the society, or as horseplayers avow, for the improvement of the breed of service men. President John A. Osper and the Board of Directors in a special assembly absolved the Secretary-Treasurer of all charges that he called a most urgent meeting during the warmest spell of the summer in order to collect dues.

The planned educational program under the capable hand of Harry Manchester was postponed because Alvar Manninen announced that he and Mrs. Manninen were the proud parents of a week old baby. Service hints came at random from all corners while the members huffed and puffed on

COMPLETE STOCKS

TRY US FOR—

Thermo Valves
Dehydrators
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Send for our catalog

FRED C. KRAMER COMPANY
212 N. Jefferson St. CHICAGO, ILLINOIS

Baby Manninen's cigars. In the excitement of welcoming our Sarge-at-Arms to the select group of Chapter Heir Conditioning experts, we neglected to ask if the specifications called for M.P.T. or F.P.T.

The August meeting will be held on the third Tuesday, August 17, at Bill Tierney's ranch. Bring a quarter and four red points of current issue for the lunch. If you are a vegetarian, just bring a quarter.

VIRGINIA CHAPTER

June 1—The Chapter held its annual election of officers on this date with the following results: *President,* Frank J. Magri; *Vice-President,* Walter E. Booth; *Secretary-Treasurer,* Ralph W. Lampie; *Sergeant-at-Arms,* Soloman Linfield; *Board of Directors,* Robert L. King, Elmer D. Weeks, Bertiam A. Hauck and A. V. Carey.

During the summer months, the Chapter is holding meetings only on emergency call, due to the fact that nearly all members are working irregular hours. Regular activities will again be organized for the fall sessions.

Ladies Auxiliary

KANSAS CITY AUXILIARY

June 8—The meeting was called to order by President C. R. Visger, in the offices of Temperature Engineering Co. The sale of greeting cards was reported to have netted $6.00, which was turned into the treasury.

During the report of members who donated blood, it was found that Mesdames Ferguson, Hataway, Hoover, Iambert, Smith and Ward had donated blood through the Kansas City Chapter Blood Donors Service. An appointment was made for July 22, at which time, another donation would be made. The balance of the evening was spent in playing games, with the prize going to Mrs. R. E. Meeker.

JARROW REPLACEMENT DOOR GASKETS

• Long life, resilient and conform to original specifications.

RECOMMENDED BY LEADING JOBBERS

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VISOLEAK

Ally yourself with the Industry program of CONSERVATION.

SAVE refrigerant and time.

SIMPLIFY leak detection problems.

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VISOLEAK shows you those "hard-to-find" leaks, and is successful with **all refrigerants.** Use four fluid ounces plus one ounce for each 10 lbs. of refrigerant to treat a system.

4 Ounce Size	$ 1.00
8 Ounce Size	1.75
1 Pint Size	3.00
1 Quart Size	5.00
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Buy it from your jobber or write direct to

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"Without Herveen, Mike, We Couldn't Have Done It!"

MIKE and Ike, two partners in refrigeration service, find more net profits in the old sock than they thought they had.

Mike can't figure it out, but Ike gives credit where it is due by naming

HERVEEN

THE REPLACEMENT GAS
for METER-MISERS

"You see, Mike, since we got wise and put **HERVEEN** on the truck last month, we don't have so many call-backs.

"**HERVEEN** saves tires and gas, but most of all it saves *time*. With this modern replacement gas we service Frigidaire Meter-Misers on the first call. The work is done with speed, safety and satisfaction. We can make many more calls. That swells net profits."

Most jobbers stock **HERVEEN**—but if yours doesn't write direct to

MODERN GAS CO., Inc.
Manufacturers and Refiners
1084 Bedford Ave., Brooklyn, N. Y.

NEW WALK-IN COOLERS FOR ARMED FORCES

U. S. Army and Navy personnel at advanced bases and on fighting fronts are benefiting as the result of a recent new development by the refrigeration industry, Mark Mooney, executive of Carrier Corporation recently asserted, describing new walk-in coolers that are now being shipped in increasing numbers. "American forces which once ate nothing but 'C' and 'D' rations are now obtaining fresh meats and vegetables, thanks to these portable refrigeration units," Mr. Mooney said.

"At the beginning of the war dependable equipment was already available for large cold storage plants and for Army camps, air bases and naval land stations," he continued. "However, very little was known about light weight, portable, demountable refrigerators that could be knocked down and stowed away in the hold of a ship, occupying a minimum of precious cargo space.

"Through the cooperation of a number of companies in the industry, we have developed such a refrigerator. It is of sectional construction and can be quickly assembled and bolted together airtight enough to be kept at 10° above zero even in tropical heat. The refrigeration unit, now being manufactured in large quantities by Carrier, is of rugged construction, especially designed to stand rough handling on ships, barges, flat cars and sandy beaches. It is so protected that it will run without interruption in snow or sleet storm, sand storm or tropic rains.

"Both the unit and controls are simple and easy to repair in case of damage, with Carrier supplying spare parts and tools with each unit that is shipped.

"There are four sizes of boxes available ranging from 675 to 6,800 cubic feet, all made of interchangeable panels. The companion refrigeration unit is designed for power by gasoline engine, electric motor or a combination of both.

Engineered to maintain a temperature of 35° F. or 10° F., the new pre-fabricated walk-in cooler is powered by electric motor driving refrigeration machine and a fan which circulates air over a cooling coil in the storage space. Operation of the compressor is controlled by a sensitive bulb thermostat inserted in the storage space. Defrosting the coil is a manual operation, accomplished by pumping water over the coil when the occasion demands.

REFRIGERATION OF COOLANT OILS

A PRACTICAL and economical method of chilling the coolant oils during high speed surface grinding is being employed by the McCorsky Tool Corporation of Meadville, Pa., manufacturers of machine tools, according to J. C. Tweedell, Field Manager for York Corporation.

Chilling the coolant oil to a constant temperature enables continuous operation of the machines for the first time. This application of refrigeration results in saving time, skilled labor, and oil which ofttimes can be re-used, according to Mr. Tweedell. The life of the machines is prolonged.

This refrigerating system, installed by the Apfel Engineering Company, is designed to maintain a constant temperature of sixty degrees during the whole period of grinding. It utilizes a York self-contained cold well water cooler. Prior to its installation, the McCorsky Corp., which uses two Thompson surface grinders, found that the coolant oil would rise from 80 to approximately 150° F. within one to two hours, making it necessary to suspend operations.

S S S

SPECIAL EQUIPMENT FOR LOW TEMPERATURE CABINET

THE temperature produced in a small cabinet in an eastern university's laboratory is so low that it requires the same cooling capacity of refrigeration machines that are used in connection with air conditioning for a four-story office building.

The same physical law that is illustrated when a glass of ice water becomes "sweated" in summer is employed in the condensation of a gas that is of great importance in the chemical field.

Two Carrier refrigeration machines supply the low temperature needed for the process, known as fractional condensation. With a total cooling capacity equivalent to the melting of 60 tons of ice a day, the machines lower the gas temperature to minus 80° F. For water to collect on the outside of a glass, the water temperature in the glass needs to be no lower than plus 50° F. on an average summer day.

S S S

John A. Locilento,
Philadelphia, Pa.

"Always enjoy a copy of THE REFRIGERATION SERVICE ENGINEER. It is *interesting.*

● Despite tightening restrictions on capacitor production, Aerovox still offers either the exact-duplicate or the universal replacement for every standard capacitor-start electric motor.

Refer to the latest Aerovox capacitor listings for the types still available. You can readily pick out the right capacitor for the job.

Remember, Aerovox jobbers carry a stock of capacitors for your convenience. This insures a ready supply, close at hand, for prompt and profitable servicing.

See Our Jobber...

● Ask for latest Aerovox motor-starting capacitor catalog. Or write us direct. If your local jobber does not carry these items, tell us his name and address.

AEROVOX *Capacitors*
INDIVIDUALLY TESTED

AEROVOX CORP., NEW BEDFORD, MASS., U. S. A.
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CAUTION TO SERVICE ENGINEERS!

For Your Protection

BE SURE THIS LABEL APPEARS ON ALL THAWZONE YOU BUY!

To our many friends, a friendly tip! For your protection, buy Thawzone ONLY in its original package and original label. Careful factory handling and specially developed closures protect the unique chemical action of Thawzone. Substitutions, over-exposure to air, improper sealing—all will prevent your getting the full effectiveness of Thawzone's balanced formula. Insist upon genuine Thawzone with original label and full instructions.

Whether you buy Thawzone in 1 oz., 4 oz. or pint sizes—look for the Blue, Black and White label shown above. At jobbers everywhere.

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NEWARK, N. J.

THAWZONE
Fully Protected by U. S. Patents
The PIONEER FLUID DEHYDRANT

NYLON A NEW PLASTIC

NYLON will enter a vast, new field as a plastic after the war, E. I. du Pont de Nemours & Co. has announced. Nylon plastic, now used for several military purposes, is characterized by the highest softening point and the greatest toughness of any plastic of its type.

The new material is a thermoplastic, which means that under heat and pressure it can be reshaped and reformed any number of times. The softening point for most thermoplastic materials is low, about 160° F; the highest previous limit was about 280° F. Nylon's is 450° F.

Thermosetting materials, the other fundamental type of plastic, cannot be remolded once they are formed under heat and pressure even though heat sufficient to char the material is applied. Nylon, with its unprecedentedly high softening point, approaches that of thermosetting materials, and overcomes a disadvantage of the thermoplastics, while retaining their advantages.

Nylon plastic's toughness is particularly useful where thin sections with great strength are required. Often it will do a job impossible for any other material.

All nylon now is strictly allotted for the military and essential civilian requirements. The bulk goes into fibers for parachute cloth, bomber tire cords and glider rope, and into large, single strands for brush bristles and surgical sutures. None will be available, other than for vital military parts, until after the war.

REFRIGERATED CARGO PLANES

FLEETS of giant refrigerated cargo planes which will bring the world's produce to the American dinner table hours instead of days after it has been gathered may be one of the early results of wartime advances in refrigeration and air conditioning, according to S. E. Lauer, president of the York Corporation.

Super refrigerated air freighters are possible even now because of the higher efficiency of refrigerants and decrease in size of the equipment, a development brought on by military needs, Mr. Lauer said. Such new equipment, he added, will play a major role in greater production of quick frozen and dehydrated foods and storage facilities.

In industry air conditioning is now an indispensable part of hundreds of delicate and exacting manufacturing operations for

such products as optical lenses, electronics tubes, aircraft instruments and chemicals. In performing this essential job, however, air conditioning has introduced a new form of working comfort which has stepped up efficiency and generally increased morale. In the modern factory and home of post-war years, air conditioning may well become standard equipment.

Mr. Lauer pointed out that refrigeration equipment has actually made possible mass production of such critical war products as synthetic ammonia, synthetic nitrates, high octane gasoline and synthetic rubber. Refrigeration has also made possible the modern strato-chamber, developed by York and used to test pilots and aircraft equipment at simulated stratosphere conditions.

* * *

METAL PLATING OF PLASTICS

A NEW process by which plastics, glass, or any non-conductor, is perfectly plated with any of the plating metals, is announced by Precision Paper Tube Company, Special Products Division, 2023 West Charleston Street, Chicago 47, Illinois.

In the new process the plating goes on the plastics as perfectly and as permanently as the best in any plated metal. Convex and concave surfaces, convolutions, corners and recesses are as thoroughly plated as flat or round surfaces. The metal plating it is claimed, is permanent. It does not crack, chip, nor peel off in long and severe service.

The advantages are many. Critical and strategic metals are conserved. Production costs are greatly reduced. Weight is saved. Design can be much simplified. Dimensional stability is insured. Oils, solvents and moisture cannot be absorbed. Electrolytic corrosion between dissimilar metals is eliminated. Heat resistance is increased.

The process can be used for plating magnetic and electric shielding of all kinds, radio shielding, electrostatic and magnetic shielding, applications as coil shields, condensers, etc. Many plastic articles can be made more permanent, more beautiful.

Both rigid and pliable types of plastic tubing and pipe fittings can be plated. The uses of the process extend into all electrical and mechanical manufacture. It is a welcome application to scientific instruments where lightness with solid precision is desirable.

The company invites all those interested to write for information and estimates.

● Idle and surplus inventories of refrigeration parts can now be put to essential use in helping to maintain the nation's huge investment in refrigeration.

We buy outright for cash, usable parts for distribution to over 20,000 refrigeration service-men customers. Let us put your idle inventories to good use—you will then be helping conserve scarce and precious materials.

The Harry Alter Co.

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ELECTRIMATIC REGULATING VALVES

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For FREON SULPHUR METHYL

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Easy adjustment . . . Simple and durable construction. Available in ⅜, ½ or ¾ inch pipe sizes . . . Ask your jobber for details.

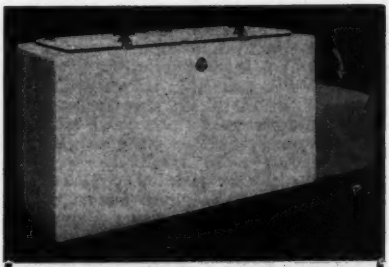
Electrimatic

Automatic Control Valves and Regulators

2100 Indiana Ave., Chicago, Ill.

Continental
FARM LOCKER PLANT

Saves Food
Right on the Farm



You're going to make many new friends, when you install or service Continental "*Kwikfreeze*" Locker Plants because you'll help them to FOOD SAVINGS. Write for Continental Farm Locker Plant War Purchase information.

SANITARY REFRIGERATOR CO.
Fond du Lac, Wisconsin

Model illustrated, No. C-1243. Capacity, 12.5 net cu. ft. Holds up to 600 lbs. of frozen food.

BUY WAR BONDS NOW...
and
FARM LOCKER PLANTS
AFTER THE WAR

PENN RECEIVES SECOND "E" AWARD

EMPLOYEES and officials of Penn Electric Switch Co., Goshen, Indiana, were again honored by the Army-Navy Production Board by the renewal of their Army-Navy "E" Award. This second award is in the form of a white service star affixed to the "E" Flag and signifies continued excellence in the production of war material.

In a letter to the Company, C. C. Bloch, Admiral, U.S.N. (Ret.), Chairman, Navy Board for Production Awards, stated: "The men and women of the Penn Electric Switch Co. have achieved a signal honor by continuing their splendid production in such volume as to justify this renewal to their award. In the first instance it was difficult to win the Army-Navy 'E' and by meriting a renewal, the management and employees have indicated their solid determination and ability to support our fighting forces by supplying the equipment which is necessary for ultimate victory."

Approximately 85 per cent of the company's peace time automatic controls have also gone to war. These include controls for heating, refrigeration, pump and air compressor applications as well as safety controls for internal combustion engines.

BONNEY WINS SECOND AWARD

EMPLOYEES of Bonney Forge & Tool Works, Allentown, Pa., have, for the second time, won the Army-Navy Production Award for "meritorious services on the production front." The original award was presented at appropriate ceremonies, October 2, 1942.

In a letter to the employees July 10, 1943, Undersecretary of War Robert P. Patterson wrote: "You have continued to maintain the high standard that you set for yourselves and which won you distinction more than six months ago. You may well be proud of your achievement. The White Star, which the renewal adds to your Army-Navy Production Award Flag, is the symbol of appreciation from our Armed Forces for your continued patriotism."

Bonney is supplying huge quantities of hand tools for all branches of the Armed Forces, as well as forgings for a wide variety of war material. Demands of the Armed Forces has made it necessary to expand the plant several times in the past two years.

NOTHING HELPS LIKE A GOOD JOBBER!

We have on hand, ready for delivery, a complete stock of repair and maintenance parts. May we please serve you?

Our South Side Branch, 809 W. 74th St., Chicago, has a complete stock for your convenience.

Automatic
HEATING & COOLING SUPPLY CO.
647 WEST LAKE STREET CHICAGO ILLINOIS

Send for our 1943 catalog to Dept. RS-3.

HERMAN GOLDBERG NEW FATHER

DESCRIBED by his proud father, Herman Goldberg, as "a promising candidate for future membership in RSES," David Mitchell Goldberg was born on July 18 at Wesley Memorial Hospital, Chicago. Both mother and child are doing well, and Herman has laid in a stock of cigars sufficient to meet all possible demands from the refrigeration industry.

S S S

NEW CATALOGS AND BULLETINS

THE AIRO SUPPLY CO., 2732 N. Ashland Ave., Chicago 14, Ill., has published a new 1943 Victory catalog. Those who have thumbed through a wholesale parts catalog, selected the items wanted and ordered them only to find that their order is returned marked "Parts not in stock," are now in for a happy surprise, according to the company.

To achieve accuracy as far as possible the company made special contact with manufacturers, getting a forecast of what equipment and parts will be available for service and repair. The book was rewritten to include a system of cross-references that makes finding wanted items a simple matter, also the pages were rearranged so as to group similar items close together for convenience in checking specifications of different makers. Due to war conditions, the edition is limited so it is suggested that service men apply for their free copy by writing on their letterhead.

EXPANSION VALVES
Rebuilt or Exchanged

Automatic (any make).....$1.25
Thermostatic (any make).....$2.75
Water valves.....$2.25

COLD CONTROLS

Domestic.....$2.00
Commercial (low or pressure).....$2.25
Commercial (high & low).....$2.75

All work done on money back guarantee.

(All fittings must accompany order)

REFRIGERATION SURPLUS DEALERS
2289 N. Karlov Ave. Chicago, Ill.

Classified Ads

Rate: Two Dollars for fifty words or less. 30 cents for each additional ten words or less.

POSITION WANTED—Refrigeration mechanic, 12 years experience. Draft exempt. Wishes position West or far West. Address Box AU-4, REFRIGERATION SERVICE ENGINEER, 435 N. Waller Av., Chicago 44, Illinois.

DESIRE appointment as local service agency, for a National Manufacturer. Can furnish necessary particulars on request. Address Louie Jorgensen, Commercial Refrigeration Maintenance Agency, 4121 39th St., San Diego 5, California.

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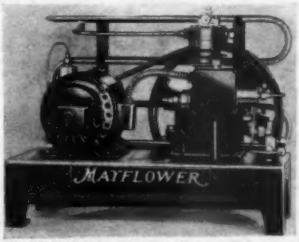

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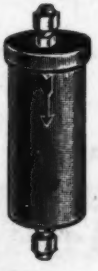

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